

# **RAC2**

## **EPA Region 2**

**Draft Supplemental Pre-Remedial Design Investigation  
Technical Memorandum**

**Old Roosevelt Field Contaminated GW Area Site  
Remedial Design  
Garden City, New York**

**EPA Contract No. EP-W-09-002  
WA 008-RDRD-02PE**

**November 10, 2009**

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**DRAFT SUPPLEMENTAL PRE-REMEDIAL DESIGN INVESTIGATION  
TECHNICAL MEMORANDUM  
OLD ROOSEVELT FIELD CONTAMINATED GROUNDWATER AREA SITE  
REMEDIAL DESIGN  
GARDEN CITY, NEW YORK**

Work Assignment No.: 008-RDRD-02PE

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# Section 1

## Introduction

### 1.1 Purpose of Report

CDM Federal Programs Corporation (CDM) received Work Assignment 008-RDRD-02PE under the Remedial Action Contract (RAC) (contract number EP-W-09-002) to perform a Remedial Design (RD) at the Old Roosevelt Field Contaminated Groundwater Area Site (the Roosevelt site), located in Garden City, Nassau County, New York, for the Environmental Protection Agency (EPA). CDM completed the Remedial Investigation/Feasibility Study (RI/FS) in 2007. The Record of Decision (ROD) was issued on September 28, 2007. The selected remedy for the site focuses on groundwater, and includes the following:

- Pre-remedial Design Investigation (PRDI)
- Installation of a groundwater extraction and treatment system west of 100 and 200 Garden City Plaza
- Discharge of the treated effluent from the treatment system in Nassau County recharge basin # 124
- Evaluation of the current air stripping treatment systems for the Garden City supply wells 10 and 11
- Site management plan (SMP) and long-term monitoring

The purpose of this technical memorandum is to present the results of the Stage 2 PRDI. Stage 2 of the PRDI included installation of two additional multi-port monitoring wells downgradient of SVP-11, and a fourth round of groundwater sampling, to investigate the newly discovered groundwater contamination south of the Village of Garden City supply wells.

### 1.2 Site Description

The Roosevelt site is an area of groundwater contamination within the Village of Garden City, in central Nassau County, New York (Figure 1-1). The site is located on the eastern side of Clinton Road, south of the intersection with Old Country Road; it includes the area of the former Roosevelt Field airfield (Figure 1-2). The former Roosevelt Field airfield area is currently developed as a large retail shopping mall with a number of restaurants, and a movie theater. A thin strip of open space along Clinton Road (known as Hazelhurst Park) serves as designated parkland and a buffer with the residential community. Several office buildings (including Garden City Plaza) are on the western perimeter of the mall and share parking space with the mall. Two recharge basins are directly east and south of the mall area. The eastern basin, Pembrook, is on property owned by the mall. The basin to the south is Nassau County recharge basin # 124.

Two municipal supply well fields are located south (downgradient) of the site. The Village of Garden City public supply wells (designated as wells 10 and 11) are just south of the office park (on the western side of the mall) on the eastern side of Clinton

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Road. The Hempstead well field is approximately 1 mile south of the Garden City supply wells.

### **1.3 Report Organization**

This Supplemental PRDI Technical Memorandum is organized as described below. The tables and figures are presented at the end of the report.

- Section 1      Introduction - presents the purpose of the technical memorandum and provides a brief site description.
- Section 2      Stage 2 Pre-remedial Design Investigation Activities - describes the methodology and sampling rationale for the Stage 2 investigation.
- Section 3      Results of PRDI - discusses the results of the PRDI, including the horizontal and vertical extent of VOC contamination in groundwater.
- Section 4      Conclusions- presents conclusions of the PRDI.

# **Section 2**

## **Supplemental Pre-remedial Design**

### **Investigation Activities**

#### **2.1 Supplemental Groundwater Investigation**

The supplemental PRDI groundwater investigation included installation of two multi-port monitoring wells downgradient of SVP-11, and a fourth round (Round 4) of groundwater sampling, to investigate the newly discovered groundwater contamination south of the Village of Garden City supply wells. Figure 2-1 illustrates the locations of the new monitoring wells and all wells sampled during the Round 4 groundwater sampling event. All field activities were conducted in accordance with the following documents:

- CDM RD Updated Work Plan, dated February 12, 2009
- CDM RD Quality Assurance Project Plan (QAPP) Addendum, dated February 19, 2009
- CDM Health and Safety Plan Addendum, dated June 19, 2008

During the field investigation, deviations from the QAPP were documented on field change request (FCR) forms, which are presented in Appendix A. The forms describe deviations, the reason for the deviation, and the recommended modification. The deviations were discussed with the EPA remedial project manager, and were agreed upon by the CDM site manager, task manager, and the field team leader. None of the changes affected the project objectives or the representativeness, completeness, precision, or accuracy of the data collected in the field. The FCRs are discussed in the following sections, as appropriate.

##### **2.1.1 Multi-Port Monitoring Well Installation**

Two additional multi-port monitoring wells (MW-SVP12 and MW-SVP13) were installed south of MW-SVP11 to investigate the vertical and horizontal extent of contamination downgradient of MW-SVP11 (Figure 2-1), due to higher than expected levels of volatile organic compounds (VOCs) in that well.

CDM contracted Uni-tech Drilling (UTD), Inc. to perform the monitoring well installation. UTD used a Failing CF-1500 drill rig to install the wells and perform the associated well development. Multi-port monitoring well construction diagrams for MW-SVP12 and MW-SVP13 are presented in Appendix B.

###### **2.1.1.1 Drilling Program**

The drilling program included installation of boreholes for subsequent Westbay multi-port well installation. Boreholes for the monitoring wells were drilled using hollow stem auger and mud rotary drilling methods. Borehole installation began by advancing 10.25-inch inside diameter (ID) hollow stem augers from the surface to a depth of approximately 60 feet below ground surface (bgs) in MW-SVP12 and 50 feet

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bgs in MW-SVP13. Subsequently, an 8.75-inch outside diameter (OD) tricone roller bit was advanced, using mud rotary drilling methods, to a final depth of 535 feet bgs. Drill cuttings were contained and placed into 20-cubic yard rolloff containers, stationed at each borehole/well location.

**2.1.1.2 Outer Screen and Casing Installation and Development**

Following drilling, stainless steel outer screen and casing were installed into the borehole. The 4-inch diameter, stainless steel wells were set in the boreholes at a depth of 525 feet bgs. The stainless steel wells consisted of lengths of riser casing and 5-foot length, 10-slot (0.010-inch) well screens, with flush-threaded joints. The deepest section of the well contained a 10-foot sump with a welded bottom plug. Well screens (six in each well) were placed at pre-determined depths shown on Table 2-1, to correspond with previously installed multi-port wells and trichloroethene (TCE) plume depths. The deepest port is at the bottom of the Magothy Formation, just above a regional clay layer.

Morie #1 sand filter pack was gravity-fed through a tremie pipe placed into the borehole annulus, and extended up to a depth of at least five feet above the top of deepest well screen. Subsequently, a mixture of bentonite slurry and Morie #1 sand was pumped into the borehole annulus via tremie pipe, to a depth approximately 10 feet below the bottom of the next well screen. Alternating layers of Morie #1 sand and bentonite slurry/Morie #1 sand mixture were placed into the borehole annulus to the surface. The borehole annulus around the well screens was filled with Morie #1. A steel flush-mount protective casing was set around each well within a 2 x 2-foot concrete pad flush with the surface grade. FCR #6 described the change from bentonite slurry/Morie #3 sand to bentonite slurry/Morie #1 sand due to difficulty in pumping the mixture.

Well development of each stainless steel, 10-slot outer screen well zone was monitored by CDM as it was performed by UTD personnel. A minimum of three well volumes of water was purged from each well screen zone, using air lift development methods (see FCR #7).

During well development, CDM measured water quality parameters of pH, temperature, specific conductance, dissolved oxygen (DO), oxygen reduction potential (Eh), and turbidity. Well development was complete when purge water had a turbidity reading of less than 10 Nepthelometric Turbidity Units (NTU) and other parameters had stabilized to within 10 percent for three consecutive readings. Data obtained during the outer screen development were recorded on well development data sheets, included as Appendix D.

**2.1.1.3 Downhole Gamma Logging**

Prior to installing multi-port wells, CDM conducted downhole gamma logging within the 4-inch outer screen and casing at MW-SVP12 and MW-SVP13. A gamma log was also run in multi-port well MW-SVP11, which was not able to be logged during the original PRDI. Two natural gamma logs were run at each location: one from the top

down and one from the bottom up. The natural gamma logs are presented in Appendix C.

#### **2.1.1.4 Multi-Port Monitoring Well Installation**

Multi-port monitoring wells were installed at MW-SVP12 and MW-SVP13 by Westbay personnel, assisted by UTD and CDM. The 1.5-inch diameter Westbay multi-port wells were installed inside the 4-inch diameter stainless steel well casings. Westbay well designs for both of the additional monitoring wells were identical. Measurement ports were set at depths within each outer well screen. Pumping ports were set 10 feet below the measuring ports. Westbay multi-port monitoring well construction diagrams are provided in Appendix B.

Westbay multi-port wells were comprised of sections of polyvinyl chloride (PVC) riser casings, packers, measurement ports, pumping ports, couplers, magnetic collars, and end-caps. Westbay well sections were attached via PVC couplers and were secured using plastic wire ties. Following every connection, each joint was pressure tested to ensure that the joint seal was properly secure, prior to lowering the assembly into the well for installation. Each multi-port well was constructed piece-by-piece from the bottom to the top as each section was lowered into the borehole, following joint testing.

Joint testing consisted of inserting portable mini-packers into the interior of each well joint of two connected PVC sections. Then the mini-packers were inflated with water to secure them against the PVC well. Westbay personnel checked the pressure reading of the joint, to ensure that the parts were competent and properly connected. Following joint testing, the packers were deflated and removed, and the PVC well section was lowered inside the stainless steel well. Subsequently, the next Westbay PVC section was added to the well assembly and was joint tested, as above. Following installation of the Westbay well inside the stainless steel well casing, water within the well screen zones was allowed to equilibrate for a period of approximately 30 minutes.

Following equilibration, pre-inflation testing of the Westbay well was performed using the Westbay sampling tool. The Westbay sampling tool was lowered inside the Westbay well and attached to each measurement port and activated to record pressure readings inside and outside the well casing. Following pre-inflation testing, the sampling tool was retracted and the Westbay well packers were inflated with water. Following packer inflation, post-inflation testing was conducted using the Westbay tool, as above. Pre-inflation and post-inflation testing data were recorded on Westbay field data sheets, included in Appendix E.

Following multi-port monitoring well installation, well development of each pumping port zone was performed by CDM. Each pumping port was opened using the Westbay open/close tool. Subsequently, 1-inch diameter high-density polyethylene (HDPE) tubing was lowered into the Westbay well approximately 20 feet into the water column. A stainless steel foot valve was connected to the bottom of the tubing. The HDPE tubing was affixed to a Waterra pump at the surface. The Waterra pump was activated causing the tubing to rise and fall repeatedly to purge the well. Water

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was purged from the well through the HDPE tubing and discharged directly into 5-gallon buckets. CDM measured water quality parameters in the same manner as described in Section 2.1.1.2. Well development was complete when three volumes of water were purged from each zone. Well development field data was recorded on Westbay data sheets and water quality data sheets included as Appendix D.

### **2.1.2 Groundwater Sampling**

CDM collected one round of groundwater samples (Round 4) from 13 Westbay multi-port wells (MW-SVP01 through MW-SVP13), 3 existing monitoring wells (N-8068, N-10019 and N-10020), and 2 municipal supply wells (Garden City wells No. 10 and 11); locations are shown on Figure 2-1. Water levels and pressure measurements were collected prior to collecting groundwater samples as shown on Table 2-2.

Background groundwater samples were collected from the upgradient multi-port well, MW-SVP01, located north of Old Country Road, for comparison with investigation samples. MW-SVP01 is located approximately 500 feet due north of the site, in an area unaffected by potential contaminants related to site activities. Background samples were analyzed for the same parameters as the investigation samples.

All groundwater and quality assurance/quality control (QA/QC) samples were analyzed for trace Target Compound List (TCL) VOCs. Selected samples were also analyzed for Target Analyte List (TAL) metals, biochemical oxygen demand (BOD), filtered iron and manganese, unfiltered iron and manganese, hardness, total dissolved solids (TDS), total suspended solids (TSS), total Kjeldahl nitrogen (TKN) and ammonia. Groundwater samples for filtered iron and manganese analyses were field-filtered using new, dedicated 0.45-micron filters and a peristaltic pump. Table 2-3 summarizes the wells that were sampled and their analyses for the Round 4 groundwater sampling event.

#### **2.1.2.1 Multi-port Monitoring Wells**

All multi-port monitoring well samples were collected using Westbay sampling equipment, which included a tripod with a manual reel, an electronic sampling probe with interface unit that monitored and controlled pressure, a manual vacuum pump, and a series of four 250 milliliter (mL) stainless steel samplers. It should be noted that port 1 is at the bottom of each multi-port well, with the port numbers increasing as the ports get shallower in depth.

Prior to lowering the sampling probe with the stainless steel samplers, a manual vacuum pump was used to create a vacuum in the samplers. Once the probe and tubes were lowered to the appropriate port, an air tight seal was created between the port and the sampling probe, and a correct water pressure reading was verified. This air tight seal and the vacuum forced water from the port to fill the 250 mL stainless steel samplers. A pre-printed form supplied by Westbay was completed by CDM to ensure the correct procedure was followed. Water quality parameters were collected and recorded on groundwater sampling forms, including conductivity, Eh, turbidity, pH, temperature, and DO. The completed forms are included in Appendix F. All

equipment was properly decontaminated between each port to prevent cross contamination.

#### **2.1.2.2 Existing Monitoring Wells**

Three existing Nassau County monitoring wells , N-8068, N-10019 and N-10020, were sampled during Round 4; these wells are designated as GWX-8068, GWX-10019 and GWX-10020, respectively.

GWX-10019 and GWX-10020 were purged and sampled using a two-inch diameter submersible Grundfos pump with dedicated ¾-inch Teflon™-lined polyethylene tubing, following the site-specific, low-flow, minimum drawdown sampling procedure described in the Final QAPP Addendum. GWX-8060 was sampled from a tap located prior to the treatment system. Water quality parameters DO, Eh, turbidity, pH, temperature, and conductivity were recorded during the low-flow well purging activity until parameter stabilization was achieved. Low-flow groundwater sampling sheets are included in Appendix G.

#### **2.1.2.3 Garden City Municipal Supply Wells**

Village of Garden City supply wells 10 and 11 were sampled during Round 4; these wells are designated as GWP-10 and GWP-11, respectively (see Figure 2-1). The water from these wells is currently treated with air strippers to remove VOC contamination. Samples were collected from taps located in the pump houses, prior to treatment.

Groundwater quality parameters DO, Eh, pH, temperature, conductivity, and turbidity were measured in the field. These measurements were recorded on Low-Flow Sampling Forms, and are presented in Appendix G.

Water levels were not collected from the Village of Garden City supply wells because they were inaccessible for water level measurement equipment.

### **2.2 Control of Investigation-Derived Waste**

Soil and water investigation derived waste (IDW) were contained and controlled during field activities. During drilling/monitoring well installation, soil cuttings and drilling mud were contained in 20-cubic yard rolloff containers. Water IDW generated during drilling consisted of decontamination rinsate and purge water from well development; all water IDW was pumped into a 21,000-gallon Adler waste tank. Rinsate collected from the decontamination pad was also pumped into the water tank. All IDW was sampled, transported, and disposed of by Seacoast Environmental Services.

# **Section 3**

## **Results of Stage 2 PRDI**

### **3.1 Approach to the Evaluation of Contamination**

The main contaminants in groundwater at the Roosevelt site are tetrachloroethylene (PCE), TCE, 1,1-dichloroethane (1,1-DCE), cis-1,2-dichloroethene (cis-1,2-DCE), and carbon tetrachloride. Discussions of groundwater contamination focus on these five contaminants.

Data from multi-port wells, existing monitoring wells, and Village of Garden City supply wells were screened against EPA's National Primary Drinking Water Maximum Contaminant Levels (MCLs), New York State Standards and Guidance Values for Class GA Groundwater (Human Water Source), and New York State Department of Health (NYSDOH) Drinking Water Quality Standards. In the case where more than one standard or criteria existed, the lowest, or most stringent, value was used as the site-specific groundwater screening criteria. The groundwater screening criteria was presented in the first PRDI technical memorandum. All five main contaminants have a MCL of 5 µg/L.

Analytical data were entered into the site database and then exported to an Environmental Geographic Information System (EGIS) for evaluation and graphical presentation. Groundwater sample results for organics and inorganics are presented in microgram per liter ( $\mu\text{g}/\text{L}$ ); wet chemistry parameters are presented in milligram per liter (mg/L).

Some of the analytical results were qualified as estimated ("J" qualifier) during data validation due to exceeded quality control criteria, including poor matrix spike and calibration and surrogate recovery. One sample had 7 rejected VOC data due to exceeded internal standard criteria. This represents 0.1 percent of the VOC data, none of which were contaminants of concern. The data that were estimated were determined to be usable. A complete discussion of data validation, data usability, and data quality objectives (DQOs) is included in the Data Usability Report presented in Appendix I. All DQOs established in the QAPP Addendum were met.

### **3.2 Water Level Measurements**

During Round 4, the water table elevation at the site was measured at 62.42 feet above mean sea level (msl) (at MW-SVP01 in the north) and 50.40 feet above msl (at MW-SVP08 in the south); general groundwater flow is to the south. The groundwater flow gradient is approximately 0.0014. Table 2-2 presents pressure measurements and water level elevations for multi-port wells. Water level elevations were used to create groundwater flow maps at four depths within the aquifer, and are presented in Figures 3-1a through 3-1d. Figure 3-2 presents a north-south cross section depicting geologic units, downhole gamma logs, and water level contours.

Water level elevation data from the multi-port wells were used to evaluate the vertical hydraulic gradient at each multi-port well location. In general, the multi-port well elevations indicate that the vertical groundwater flow is downward, however, a few exceptions are noted. Data indicate a slight upward gradient in the bottom of MW-SVP10 and MW-SVP11, between the bottom two ports. Also, the bottom port in MW-SVP13 indicates a strong upward gradient; however, this measurement is presumed to be either an anomaly or an error, as no other multiport wells in the area indicate such a strong upward gradient. In general, vertical gradients in multi-port wells located in the mall area are smaller than those in the downgradient area. For example, differences between water levels in the shallow and deep ports in mall area wells are generally less than 2 feet, whereas in the downgradient area, they are in excess of 10 feet.

### 3.3 Gamma Log Results

CDM conducted downhole gamma logging at the two new multi-port wells, MW-SVP12 and MW-SVP13, to correlate with previous gamma logs and to aid in determining the lithology in the area. In addition, a gamma log was also conducted at MW-SVP11, which was not able to be logged prior to Round 3 sampling. Gamma logs are presented in Appendix C. Figure 3-2 includes gamma logs for all wells in the cross-section, including those for MW-SVP11, MW-SVP12, and MW-SVP13. In general, the new gamma logs are consistent with gamma logs from the RI wells, and indicate a fairly coarse-grained material (sand) interspersed with layers of finer-grained material.

### 3.4 Round 4 Groundwater Results

#### 3.4.1 Multi-port Well Results

Of the five site-related contaminants, TCE and PCE were detected most frequently, and at levels exceeding screening criteria in many of the samples. TCE levels were generally higher than PCE levels, with the highest TCE concentrations in MW-SVP10 (960 µg/L), MW-SVP09 (580 µg/L), and MW-SVP-11 (430 µg/L). The highest levels of PCE were found in MW-SVP10 (300 µg/L) and supply well GWP-10 (150 µg/L). Cis-1,2-DCE and 1,1-DCE were detected less frequently, with limited exceedances. Carbon tetrachloride was detected in very few samples, at very low levels below screening criteria. Results from the round 4 groundwater sampling event are presented in Table 3-1, and shown on Figure 3-3.

#### MW-SVP01

MW-SVP01 is the background well, located upgradient of the site. No site-related VOCs exceeded screening criteria in this well. TCE, PCE, and 1,1-DCE were detected at trace levels (TCE at 0.92 µg/L and PCE at 0.65 µg/L in port 3, and 1,1-DCE at 1.4 µg/L in port 2). Carbon tetrachloride and cis-1,2-DCE were not detected. These contaminant levels in the upgradient background well are significantly lower than those found in downgradient multi-port, existing monitoring, and Village of Garden City supply wells, and indicate background levels outside the influence of site-related contamination.

#### MW-SVP02

MW-SVP02 is located just west of 100 Ring Road and the former cooling water well N-8050. PCE, TCE, and cis-1,2-DCE were detected; 1,1-DCE and carbon tetrachloride were not. PCE was detected in all but the top 2 ports, but exceeded its screening criterion in only port 4 (5.4 µg/L). TCE exceeded its screening criterion in all but the top port. TCE levels ranged from 0.93 µg/L to 39 µg/L, with the highest level in port 9. Cis-1,2-DCE was detected in all but the top port, but exceeded its screening criterion in only port 4 (5.2 J µg/L).

#### MW-SVP03

MW-SVP03 is located in the Roosevelt Field mall parking lot, east of the Garden City Plaza office complex. TCE was the only site-related VOC to exceed its screening criterion. TCE exceedances were found in the bottom three ports at levels ranging from 8.3 - 30 µg/L; the highest level was in port 2. PCE was detected in four ports, 1,1-DCE was detected in three ports, and cis-1,2-DCE was detected in one ports, all at levels below screening criteria. Carbon tetrachloride was not detected.

#### MW-SVP04

MW-SVP04 is located just west of 200 Garden City Plaza. During the RI (sampling Rounds 1 and 2) and the initial PRDI (Round 3), this well contained the highest contaminant levels. Although round 4 PCE levels in MW-SVP04 remained high in many ports, higher PCE levels were found in wells further downgradient (MW-SVP10 and monitoring well GWX-8068).

PCE and TCE exceeded screening criteria in all but the top two ports. PCE exceedances ranged from 10 - 120 µg/L, and TCE exceedances ranged from 13 - 44 µg/L. Port 6 contained the highest levels of both PCE and TCE. 1,1-DCE was detected at levels below its screening criterion in ports 1 through 6. Cis-1,2-DCE was detected at levels below its screening criterion in all but the top port. Carbon tetrachloride was detected below its screening criterion in two ports.

#### MW-SVP05

MW-SVP05 is located in Garden City Plaza, southeast of MW-SVP04. TCE was the only VOC to exceed its screening criteria. TCE was detected in all but the top two ports, and exceeded screening criteria in ports 2, 4, and 5. TCE exceedances ranged from 6.1 - 43 µg/L, with the highest concentration in port 2.

#### MW-SVP06

MW-SVP06 is located in a residential area on Meadow Street. This well was installed as one of two sentinel wells for the Hempstead well field, and contains the lowest levels of site-related VOCs. It is also downgradient of several other contaminant sites (Pasley, Purex, and Win-Holt) in the area.

The only exceedances were 1,1-DCE (6.6 J µg/L) and cis-1,2-DCE (15 J µg/L), both in port 5. TCE was detected at levels below its screening criteria in ports 1, 3, 4, and 5. PCE and carbon tetrachloride were not detected in any of the ports.

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**MW-SVP07**

MW-SVP07 is located in a residential area west of Commercial Avenue, along the former Long Island Railroad tracks. This well is side-gradient to the groundwater flow from the mall area.

PCE and TCE both exceeded screening criteria in ports 1, 2, and 3, and were detected below screening criteria in port 5. PCE levels ranged from 5.6 – 13 µg/L, with the highest levels in ports 1 and 2. TCE exceedance levels ranged from 14 – 30 µg/L, with the highest level in port 2. 1,1-DCE was detected in the bottom three ports, and exceeded its screening criterion in the bottom two (13 J µg/L in port 1 and 23 µg/L in port 2). Cis-1,2-DCE was detected at levels below its screening criterion in the bottom three ports. Carbon tetrachloride was not detected.

**MW-SVP08**

MW-SVP08 is the furthest downgradient multi-port well from the Roosevelt Field mall area, located in a residential area on the corner of Clinton Road and Meadow Street. This well was installed one block north (upgradient) of the Hempstead well field, as the main sentinel well for the well field. It is due west of MW-SVP06, and similarly to that well, is also downgradient of other contaminant sites in the area.

PCE exceeded its screening criterion in all but the top port; levels ranged from 8.2 – 51 J, with the highest level in port 5. TCE and cis-1,2-DCE were detected at levels below the screening criteria; TCE in ports 1 through 5, and cis-1,2-DCE in ports 2 and 5. 1,1-DCE and carbon tetrachloride were not detected.

**MW-SVP09**

MW-SVP09 is located upgradient of MW-SVP04 and just northwest of 100 Ring Road, and was installed to determine the northern boundary of the VOC plume. With the exception of carbon tetrachloride, all site-related VOCs exceeded screening criteria in this well.

PCE was detected in all but the top port, and exceeded its screening criterion in ports 4 through 8; levels ranged from 0.62 to 27 µg/L, with the highest level in port 5. TCE was detected in all 10 ports, with all but the top port exceeding the screening criterion. TCE levels ranged from 0.55 to 580 µg/L, with the highest concentration in port 8. 1,1-DCE was detected in seven ports, with an exceedance in port 2; levels ranged from 0.6 to 7.7 J µg/L. Cis-1,2-DCE was detected in seven ports, with an exceedance in port 6; levels ranged from 0.32 – 27 µg/L. Carbon tetrachloride was detected at trace levels in two ports.

**MW-SVP10**

MW-SVP10 is located on the west side of the Garden City Plaza office complex (near existing well GWX-10019), and was installed to help define the vertical and horizontal extent of the VOC plume core at the location of the three remedial action extraction wells. The highest TCE concentration and the second highest PCE concentration were in this well.

PCE was detected in 8 of the 10 ports, with levels ranging from 0.36 J to 300 µg/L. The exceedance in port 3 (300 µg/L) was the second highest PCE concentration during the Round 4 sampling event. TCE was detected in all ports, with levels ranging from 0.31 J to 960 µg/L. Port 2 (960 µg/L) contained the highest TCE concentration during Round 4. 1,1-DCE was detected at levels below its screening criterion in ports 3 and 7, at 4.9 J and 0.32 J µg/L, respectively. Cis-1,2-DCE was detected in all but the top port and exceeded its screening criterion in two ports; levels ranged from 0.41J to 69 µg/L, with the highest concentration in port 2. Carbon tetrachloride was detected in three ports below its screening criterion.

#### MW-SVP11

MW-SVP11 is located near the corner of Clinton Road and Stewart Avenue, on the Stewart School property. It was installed just downgradient of the two municipal supply wells to determine whether site-related contaminants were migrating past the supply wells' pumping influence.

PCE was detected in all but the top two ports, and exceeded its screening criterion in three ports. PCE levels ranged from 0.34 J - 12 J µg/L, with the highest level in port 3. TCE was detected in all but the top two ports, but exceeded its screening criterion in seven ports. TCE levels ranged from 0.99 - 430 µg/L; the highest level, in the bottom-most port, was the third highest overall TCE concentration in Round 4. 1,1-DCE was only detected in port 2, at 1.2 J µg/L. Cis-1,2-DCE was detected in seven ports and exceeded its screening criterion in six ports; levels ranged from 0.56 - 120 µg/L, with the highest level in the bottom-most port. Carbon tetrachloride was detected in five ports at levels below its screening criterion.

#### MW-SVP12

MW-SVP12 is located near the corner of Clinton Road and Commercial Avenue, approximately 1,300 feet south (downgradient) of MW-SVP11. This well was installed during the supplemental PRDI to delineate the southern VOC contaminant plume.

PCE, TCE, and cis-1,2-DCE were detected in all six ports. PCE exceeded screening(s) criterion in two ports; levels ranged from 0.52 - 5.8 µg/L, with the highest level in port 4. TCE exceeded its screening criterion in five of the six ports; levels ranged from 4.9 - 95 µg/L, with the highest level in port 4. Cis-1,2-DCE exceeded the screening criterion in ports 3 and 4 (10 µg/L). 1,1-DCE and carbon tetrachloride were each detected in ports 3 and 4 at levels below their screening criteria.

#### MW-SVP13

MW-SVP13 is located approximately 1,200 feet east/northeast of MW-SVP12, on the south side of Stewart Avenue, in a grassy strip in front of the FedEx building. This well was installed to delineate the southern boundary of the VOC contaminant plume.

PCE and TCE exceeded their screening criteria in all six ports. PCE levels ranged from 9.9 - 60 µg/L, with the highest level in port 3. TCE levels ranged from 18 - 100 µg/L, with the highest level also in port 3.

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1,1-DCE was detected at levels below its screening criterion in three ports. Cis-1,2-DCE was detected below its screening criteria in all six ports. Carbon tetrachloride was detected below screening criteria in one port.

### **3.4.2 Existing Monitoring Well and Supply Well Results**

Monitoring well GWX-8068 contained the highest PCE concentration of all samples in Round 4 (420 µg/L). Results from the Round 4 groundwater sampling event are presented in Table 3-1. TCE and PCE results are shown on Figure 3-3.

#### **GWP-10 and GWP-11**

Village of Garden City supply wells GWP-10 and GWP-11 have historically contained high levels of site-related contaminants since they were first sampled in the 1970s, although levels have shown a decreasing trend since the mid-1990s. Both wells contained TCE and PCE above their screening criteria.

PCE was detected at 150 µg/L in GWP-10 and at 91 µg/L in GWP-11. TCE was detected at 42 µg/L in GWP-10 and at 60 µg/L in GWP-11. 1,1-DCE was detected in both wells at 3 µg/L and 2.3 µg/L, respectively. Cis-1,2-DCE was above the screening criterion at GWP-11 (7.9 µg/L) but below in GWP-10 (2 µg/L). Carbon tetrachloride was not detected.

#### **GWX-10019 and GWX-10020**

GWX-10019 is an existing Nassau County monitoring well (also known as N-10019) located just west of the Garden City Plaza office complex. It is a conventional well screened from 223 to 228 feet bgs. Only cis-1,2-DCE exceeded its screening criterion at 5.1 µg/L. TCE was detected at 3.1 µg/L. PCE, 1,1-DCE, and carbon tetrachloride were not detected.

GWX-10020 is an existing Nassau County monitoring well (also known as N-10020) located just south of the Garden City Plaza office complex. It is a conventional well screened from 185 to 190 feet bgs. None of the site-related VOCs were detected in this well.

#### **GWX-8068**

GWX-8068 is an existing Nassau County monitoring well (also known as N-8068), located at 585 Stewart Avenue, near the southern entrance to the Roosevelt Field Mall area (south Ring Road). This well is the eastern-most well that was sampled during Round 4, and is approximately 1,800 feet east of MW-SVP11. It is screened from 265-290 feet bgs.

GWX-8068 contained the highest overall PCE concentration during Round 4, at 420 µg/L. TCE and 1,1-DCE also exceeded their screening criteria, at 76 µg/L and 11 J µg/L, respectively. Cis-1,2-DCE and carbon tetrachloride were detected below their screening criteria.

### 3.5 Summary of Groundwater Contamination

The results from the Round 4 groundwater sampling event were used to prepare a cross section of PCE and TCE in groundwater. Figure 3-3 shows the cross-section location, and Figure 3-4 illustrates the PCE and TCE plumes in a north-south cross section through the core of the plumes. PCE and TCE isocontours were estimated for 5, 100, and 200 µg/L (the MCL for both PCE and TCE is 5 µg/L). For the purposes of this discussion, levels above 100 µg/L are considered the "plume core". PCE isocontours are shown in dark pink and TCE isocontours are shown in green. Contours are dashed to indicate estimated locations of contamination.

#### PCE

The general shape of the PCE plume core during Round 4 is similar to that during Round 3, except that it has migrated south. The shape is also consistent with a southerly migrations evidenced by higher concentrations and the thinning of the plume just upgradient of the two pumping wells.

As shown on Figure 3-4, the plume core is located in the vicinity of MW-SVP04, MW-SVP10, and GWP-10. At MW-SVP04, the plume core is approximately 130 feet thick, and located from approximately 220 - 360 feet bgs; this is similar in thickness and depth to Round 3 data. PCE levels within the plume core in MW-SVP04 range from 83 - 120 µg/L. The most contaminated area of the plume core is found in MW-SVP11, at 300 µg/L. The plume core in this well is thinner, approximately 75 feet thick, and located deeper than in MW-SVP10, from approximately 325-400 feet bgs. The plume core then dips south to GWP-10, also approximately 75 feet thick, occurring at 340 - 415 feet bgs. Groundwater flows south, with a downward gradient; however, pumping at GWP-10 and GWP-11 may account for the steeper dip in elevation of the plume core.

The 5-µg/L PCE isocontour is more extensive, spanning from MW-SVP09 in the north to just south of MW-SVP12. The shape of this contour indicates that it is shallowest (just over 100 feet bgs) and approximately 375 feet thick at MW-SVP09. In MW-SVP04, the depth is similar, but extends to approximately 450 feet. The 5-µg/L contour dives downward and becomes thinner (approximately 110 feet thick) in the vicinity of MW-SVP10 and the two supply wells. Moving further south, away from the influence of the pumping wells, the plume thickens again in the vicinity of MW-SVP11 and MW-SVP13. Low levels are present in MW-SVP12 (just above 5 µg/L) and the plume thins (to approximately 100 feet thick). Levels in MW-SVP12 are low, just above 5 µg/L, and occur deeper in the aquifer at approximately 320 - 420 feet bgs.

It should be noted that PCE levels that exceed its screening criterion are also found in the southern-most well, MW-SVP08 in all but the shallowest port, at levels ranging from 51 J at approximately 100 feet bgs, to 8.2 µg/L at approximately 450 feet bgs. The shallow detections of PCE in this well indicate that it cannot be correlated to PCE contamination from the Roosevelt Field mall area, which appears to pinch out at a deeper depth, just south of Stewart Avenue. In addition, all Roosevelt monitoring

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wells have a downward groundwater gradient, indicating the shallower contamination is not from the mall area.

**TCE**

The core of the TCE plume appears in two separate areas: a smaller area in the vicinity of MW-SVP09; and a larger, more downgradient area in the vicinity of MW-SVP10 and MW-SVP11. In the vicinity of MW-SVP09, the plume core is approximately 190 feet thick, and occurs from approximately 90 - 280 feet bgs. TCE levels in this interval range from 120 - 580 µg/L. The highest TCE levels, however, are found in the larger, more downgradient area. The two pumping wells are located between MW-SVP10 and MW-SVP11; however, the plume core separates into two lobes, and occurs above and below the screen intervals in the two supply wells, as shown in Figure 3-4. The highest TCE concentration is found in MW-SVP10, at approximately 390 feet bgs. This interval is just upgradient and at a similar elevation to the intervals in the pumping wells. The three remedial action extraction wells will be installed at this location. At MW-SVP11 at Stewart school, the upper TCE plume core is approximately 210 feet thick and extends from 170 to 380 feet bgs; levels in this interval range from 160 - 270 µg/L. The lower plume core is approximately 80 feet thick, and extends from approximately 450 - 530 feet bgs (below the bottom port), with levels reaching 430 µg/L.

The area inside the 5 µg/L TCE contour line is more extensive than the area for PCE. The upper boundary of this contour ranges from approximately 90 - 165 feet bgs in the area north of Stewart Avenue. The bottom of this contour is estimated on Figure 3-4, as levels exceeding 5 µg/L extend below the bottom ports in the multi-port wells. The 5 µg/L TCE contour ends somewhere between MW-SVP12 and MW-SVP08.

## Section 4

### Conclusions

Based on data collected during Round 4, conclusions regarding groundwater contamination at the Roosevelt site are presented below.

- The highest PCE levels are as follows:
  - 420 µg/L in GWX-8068 (265-290 feet bgs)
  - 300 µg/L in MW-SVP10 (port 3, 305-310 feet bgs)
  - 150 µg/L in GWP-10 (377-417 feet bgs)
- The highest TCE levels are as follows:
  - 960 µg/L in MW-SVP10 (port 2, 400-405 feet bgs)
  - 580 µg/L in MW-SVP09 (port 8, 145-150 feet bgs)
  - 430 µg/L in MW-SVP11 (port 1, 480 - 485 feet bgs)
- As compared to Round 3, the extent of contamination during Round 4 is similar in depth and orientation, except that the PCE plume core appears to have migrated downgradient from MW-SVP04 to MW-SVP10.
- As compared to Round 3, the highest Round 4 contaminant levels are approximately 1.5 – 2 times higher for both PCE and TCE.
- Contaminant data from the two newest multi-port wells, MW-SVP12 and MW-SVP13 have helped delineate PCE and TCE contamination in the area south of the two supply wells. Data from MW-SVP12 (the most downgradient multi-port well in the mall area) were compared to data from MW-SVP08 (the southern-most well located just north of the Hempstead well field).
  - PCE levels in MW-SVP12 are below or slightly above the screening criterion, and occur only in deeper depths of the aquifer. The PCE plume appears likely to end south of MW-SVP12. In contrast, PCE levels in MW-SVP08 are at higher levels (up to 10 times the screening criterion), and occur at depths as shallow as 100 feet bgs and extend below the bottom-most port.
  - TCE in MW-SVP12 is more extensive than PCE; levels in all but the bottom-most port exceed the screening criterion, and ranged from 24 to 95 µg/L. It is unclear where the TCE plume ends south of MW-SVP12. However, TCE levels in MW-SVP08 are all below the screening criterion.
- The PCE and TCE plume cores originating in the Roosevelt Field mall area are not consistent in depth or in concentration with contamination south of the site (i.e., in the vicinity of MW-SVP08), and therefore, the contamination near the mall and just north of the Hempstead wellfield do not appear to be connected.

# Tables

**Table 2-1**  
**New Multi-port Monitoring Well Screen Intervals**  
**Old Roosevelt Field Contaminated Groundwater Area Site**  
**Garden City, New York**

Well ID	Location and Rationale	Number of Ports	Screen Intervals (feet bgs)
MW-SVP12	Located southeast of multiport monitoring well MW-SVP11, in the grassy area in front of the FedEx parking lot. Rationale: to delineate the southern boundary of the plume.	6	Port 6: 245-250 Port 5: 295-300 Port 4: 355-360 Port 3: 405-410 Port 2: 485-490 Port 1: 520-525
MW-SVP13	Located southwest of multiport monitoring well MW-SVP11, along Old Country Road. Rationale: to delineate the southern boundary of the plume.	6	

Notes:

bgs = below ground surface

**Table 2-2**  
**Groundwater Elevation Data: Round 4 Multi-port Well Pressure Readings**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Well ID	Port	Ground Surface Elevation (feet amsl)	Measurement Port Depth (feet bgs)	Port Elevation (feet amsl)	Round 4 Measurements				
					Atm. Pressure (psi)	Fluid Pressure-Outside Casing (psi)	Pressure Head (feet)	Depth to Water (feet bgs)	Water Level Elevation (feet amsl)
MW-SVP01	1	86.58	450	-363.42	14.68	196.46	419.82	30.63	55.95
	2	86.58	403	-316.42	14.68	176.64	374.04	29.36	57.22
	3	86.58	373	-286.42	14.68	163.97	344.78	28.59	57.99
	4	86.58	318	-231.42	14.68	140.58	290.76	27.55	59.03
	5	86.58	293	-206.42	14.68	129.84	265.96	27.33	59.25
	6	86.58	253	-166.42	14.68	112.8	226.61	26.64	59.94
	7	86.58	203	-116.42	14.68	91.33	177.02	26.17	60.41
	8	86.58	153	-66.42	14.68	70.02	127.81	25.33	61.25
	9	86.58	103	-16.42	14.68	48.68	78.52	24.56	62.02
	10	86.58	53	33.58	14.68	27.18	28.87	24.16	62.42
MW-SVP02	1	88.39	450	-361.61	14.655	195.29	417.17	33.28	55.11
	2	88.39	413	-324.61	14.655	179.34	380.33	33.07	55.32
	3	88.39	373	-284.61	14.655	162.11	340.54	32.82	55.57
	4	88.39	333	-244.61	14.655	144.82	300.61	32.71	55.68
	5	88.39	293	-204.61	14.655	127.55	260.73	32.55	55.84
	6	88.39	253	-164.61	14.655	110.28	220.84	32.39	56
	7	88.39	193	-104.61	14.655	84.42	161.12	32.05	56.34
	8	88.39	153	-64.61	14.655	67.25	121.47	31.66	56.73
	9	88.39	103	-14.61	14.655	45.85	72.04	31.03	57.36
	10	88.39	53	35.39	14.655	24.2	22.04	30.98	57.41
MW-SVP03	1	87.17	450	-362.83	14.645	196.44	419.85	30.6	56.57
	2	87.17	393	-305.83	14.645	171.85	363.06	30.33	56.84
	3	87.17	373	-285.83	14.645	163.25	343.20	30.17	57
	4	87.17	293	-205.83	14.645	128.88	263.82	29.46	57.71
	5	87.17	173	-85.83	14.645	77.27	144.63	28.52	58.65
	6	87.17	103	-15.83	14.645	47.15	75.07	28.01	59.16
	7	87.17	53	34.17	14.645	25.56	25.21	27.82	59.35
MW-SVP04	1	88.85	420	-331.15	14.675	182.56	387.73	32.69	56.16
	2	88.85	400	-311.15	14.675	173.93	367.79	32.6	56.25
	3	88.85	353	-264.15	14.675	153.73	321.14	32.2	56.65
	4	88.85	308	-219.15	14.675	134.32	276.32	31.98	56.87
	5	88.85	288	-199.15	14.675	125.72	256.45	31.82	57.03
	6	88.85	248	-159.15	14.675	108.5	216.69	31.55	57.3
	7	88.85	188	-99.15	14.675	82.72	157.15	31.02	57.83
	8	88.85	148	-59.15	14.675	65.53	117.45	30.68	58.17
	9	88.85	103	-14.15	14.675	46.13	72.64	30.43	58.42
	10	88.85	48	40.85	14.675	22.51	18.09	29.92	58.93
MW-SVP05	1	85.55	430	-344.45	14.635	187.58	399.41	31.02	54.53
	2	85.55	408	-322.45	14.635	177.8	376.82	31.58	53.97
	3	85.55	358	-272.45	14.635	156.12	326.76	31.59	53.96
	4	85.55	313	-227.45	14.635	136.78	282.09	31.21	54.34
	5	85.55	293	-207.45	14.635	128.27	262.44	30.84	54.71
	6	85.55	253	-167.45	14.635	111.19	222.99	30.25	55.3
	7	85.55	193	-107.45	14.635	85.89	164.56	28.61	56.94
	8	85.55	153	-67.45	14.635	68.85	125.21	27.93	57.62
	9	85.55	98	-12.45	14.635	45.34	70.91	27.16	58.39
	10	85.55	48	37.55	14.635	23.74	21.03	26.99	58.56
MW-SVP06	1	60.88	447	-386.12	14.69	198.35	424.16	23.3	37.58
	2	60.88	370	-309.12	14.69	166.07	349.61	20.77	40.11
	3	60.88	250	-189.12	14.69	114.68	230.92	19.32	41.56
	4	60.88	180	-119.12	14.69	84.58	161.41	18.76	42.12
	5	60.88	105	-44.12	14.69	55.18	93.51	11.59	49.29
	6	60.88	50	10.88	14.69	31.41	38.61	11.43	49.45
MW-SVP07	1	82.58	445	-362.42	14.67	193.18	412.26	33.18	49.4
	2	82.58	428	-345.42	14.67	185.85	395.33	33.09	49.49
	3	82.58	315	-232.42	14.67	136.73	281.89	33.41	49.17
	4	82.58	208	-125.42	14.67	91.95	178.48	29.72	52.86
	5	82.58	103	-20.42	14.67	46.79	74.18	28.9	53.68
	6	82.58	48	34.58	14.67	22.94	19.10	28.92	53.66

**Table 2-2**  
**Groundwater Elevation Data: Round 4 Multi-port Well Pressure Readings**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Well ID	Port	Ground Surface Elevation (feet amsl)	Measurement Port Depth (feet bgs)	Port Elevation (feet amsl)	Round 4 Measurements				
					Atm. Pressure (psi)	Fluid Pressure-Outside Casing (psi)	Pressure Head (feet)	Depth to Water (feet bgs)	Water Level Elevation (feet amsl)
MW-SVP08	1	62.26	435	-372.74	14.675	191.52	408.42	27.02	35.24
	2	62.26	373	-310.74	14.675	166.14	349.80	23.57	38.69
	3	62.26	238	-175.74	14.675	110.13	220.45	17.79	44.47
	4	62.26	158	-95.74	14.675	77.55	145.21	12.95	49.31
	5	62.26	103	-40.74	14.675	54.12	91.10	12	50.26
	6	62.26	48	14.26	14.675	30.34	36.18	11.86	50.4
MW-SVP09	1	90.27	482	-391.73	14.665	209.2	449.27	33.21	57.06
	2	90.27	402	-311.73	14.665	174.65	369.48	32.91	57.36
	3	90.27	352	-261.73	14.665	153.1	319.71	32.63	57.64
	4	90.27	307	-216.73	14.665	133.64	274.77	32.52	57.75
	5	90.27	287	-196.73	14.665	124.97	254.75	32.53	57.74
	6	90.27	247	-156.73	14.665	107.71	214.88	32.35	57.92
	7	90.27	187	-96.73	14.665	81.84	155.14	32.03	58.24
	8	90.27	147	-56.73	14.665	64.75	115.67	31.45	58.82
	9	90.27	102	-11.73	14.665	45.44	71.07	31	59.27
	10	90.27	47	43.27	14.665	21.66	16.15	30.86	59.41
MW-SVP10	1	87.83	482	-394.17	14.66	208.46	447.58	34.9	52.93
	2	87.83	402	-314.17	14.66	173.4	366.61	35.79	52.04
	3	87.83	352	-264.17	14.66	152.08	317.37	34.97	52.86
	4	87.83	307	-219.17	14.66	132.66	272.52	34.77	53.06
	5	87.83	287	-199.17	14.66	124.02	252.56	34.71	53.12
	6	87.83	247	-159.17	14.66	107.33	214.02	33.21	54.62
	7	87.83	187	-99.17	14.66	81.81	155.08	32.08	55.75
	8	87.83	147	-59.17	14.66	64.96	116.17	30.96	56.87
	9	87.83	102	-14.17	14.66	45.66	71.59	30.48	57.35
	10	87.83	47	40.83	14.66	21.83	16.56	30.46	57.37
MW-SVP11	1	80.32	482	-401.68	14.68	210.59	452.45	30.04	50.28
	2	80.32	402	-321.68	14.68	175.28	370.90	31.5	48.82
	3	80.32	352	-271.68	14.68	154.37	322.61	29.74	50.58
	4	80.32	307	-226.68	14.68	135.4	278.80	28.5	51.82
	5	80.32	287	-206.68	14.68	126.76	258.85	28.43	51.89
	6	80.32	247	-166.68	14.68	109.63	219.28	27.95	52.37
	7	80.32	187	-106.68	14.68	83.91	159.88	27.29	53.03
	8	80.32	147	-66.68	14.68	67.63	122.29	24.84	55.48
	9	80.32	102	-21.68	14.68	48.13	77.25	24.83	55.49
	10	80.32	(47)	33.32	14.68	24.32	22.26	24.76	55.56
MW-SVP-12	1	76.2	515	-438.8	14.655	225.46	486.85	28.67	47.53
	2	76.2	485	-408.8	14.655	212.72	457.42	28.06	48.14
	3	76.2	405	-328.8	14.655	178.64	378.72	26.69	49.51
	4	76.2	355	-278.8	14.655	157.56	330.03	25.32	50.88
	5	76.2	295	-218.8	14.655	131.98	270.96	24.33	51.87
	6	76.2	245	-168.8	14.655	110.41	221.14	24.09	52.11
MW-SVP-13	1	74.06	515	-440.94	14.675	229.74	496.69	18.85	55.21
	2	74.06	485	-410.94	14.675	214.64	461.81	23.68	50.38
	3	74.06	405	-330.94	14.675	180.28	382.46	22.95	51.11
	4	74.06	355	-280.94	14.675	158.72	332.67	22.69	51.37
	5	74.06	295	-220.94	14.675	132.91	273.06	22.23	51.83
	6	74.06	245	-170.94	14.675	111.35	223.27	21.97	52.09

Notes:

bgs = below ground surface

amsl = above mean sea level

Atm. = Atmospheric

psi = pounds per square inch

**Table 2-3**

**Summary of Round 4 Multi-port Well, Monitoring Well, and Supply Well Samples**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Well ID	Sample ID	CLP ID	Analysis	QA/QC	Collection/ Shipment Date
MW-SVP01	GWM-01-10-R4	B58X5	Trace VOC		7/22/2009
	GWM-01-1-R4	B58X6	Trace VOC		7/22/2009
	GWM-01-2-R4	B58X7	Trace VOC		7/22/2009
	GWM-01-3-R4	B58X8	Trace VOC		7/22/2009
	GWM-01-4-R4	B58X9	Trace VOC		7/22/2009
	GWM-01-5-R4	B5XY0	Trace VOC		7/22/2009
	GWM-01-6-R4	B5XY1	Trace VOC		7/22/2009
	GWM-01-7-R4	B5XY2	Trace VOC		7/22/2009
	GWM-01-8-R4	B5XY3	Trace VOC		7/22/2009
	GWM-01-9-R4	B5XY4	Trace VOC		7/22/2009
MW-SVP02	GWM-02-10-R4	B5XY5	Trace VOC		7/22/2009
	GWM-02-1-R4	B5XY6	Trace VOC		7/22/2009
	GWM-02-2-R4	B5XY7	Trace VOC		7/22/2009
	GWM-02-3-R4	B5XY8	Trace VOC		7/22/2009
	GWM-02-4-R4	B5XY9	Trace VOC		7/22/2009
	GWM-02-4-R4R*	B59B4	Trace VOC		7/27/2009
	GWM-02-5-R4	B58Z0	Trace VOC		7/22/2009
	GWM-02-6-R4	B58Z1	Trace VOC		7/22/2009
	GWM-02-7-R4	B58Z2	Trace VOC		7/22/2009
	GWM-02-8-R4	B58Z3	Trace VOC		7/22/2009
	GWM-02-9-R4	B58Z4	Trace VOC		7/22/2009
MW-SVP03	GWM-03-1-R4	B58Z5	Trace VOC		7/23/2009
	GWM-03-2-R4	B58Z6	Trace VOC		7/23/2009
	GWM-03-3-R4	B58Z7	Trace VOC		7/23/2009
	GWM-03-4-R4	B58Z8	Trace VOC		7/23/2009
	GWM-03-5-R4	B58Z9	Trace VOC		7/23/2009
	GWM-03-6-R4	B5900	Trace VOC		7/23/2009
	GWM-03-7-R4	B5901	Trace VOC		7/23/2009
MW-SVP04	GWM-04-10-R4	B5902	Trace VOC		7/23/2009
	GWM-04-1-R4	B5903	Trace VOC		7/23/2009
	GWM-04-2-R4	B5904	Trace VOC		7/23/2009
	GWM-04-3-R4	B5905	Trace VOC		7/23/2009
	GWM-04-4-R4	B5906	Trace VOC		7/23/2009
	GWM-04-5-R4	B5907	Trace VOC		7/23/2009
	GWM-104-5-R5	B5912	Trace VOC	Duplicate of GWM-04-5-R4	7/23/2009
	GWM-04-6-R4	B5908	Trace VOC		7/23/2009
	GWM-04-7-R4	B5909	Trace VOC		7/23/2009
	GWM-04-8-R4	B5910	Trace VOC		7/23/2009
	GWM-04-9-R4	B5911	Trace VOC		7/23/2009

**Table 2-3**

**Summary of Round 4 Multi-port Well, Monitoring Well, and Supply Well Samples**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Well ID	Sample ID	CLP ID	Analysis	QA/QC	Collection/ Shipment Date
MW-SVP05	GWM-05-10-R4	B5913	Trace VOC		7/24/2009
	GWM-05-1-R4	B5914	Trace VOC		7/24/2009
	GWM-05-2-R4	B5915	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese		7/24/2009
	GWM-05-3-R4	B5916	Trace VOC		7/24/2009
	GWM-05-4-R4	B5917	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese		7/24/2009
	GWM-05-5-R4	B5918	Trace VOC		7/24/2009
	GWM-05-6-R4	B5919	Trace VOC		7/24/2009
	GWM-05-7-R4	B5920	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese		7/24/2009
	GWM-05-8-R4	B5921	Trace VOC		7/24/2009
	GWM-05-9-R4	B5922	Trace VOC		7/24/2009
MW-SVP06	GWM-06-1-R4	B5923	Trace VOC		7/23/2009
	GWM-06-2-R4	B5924	Trace VOC		7/23/2009
	GWM-06-3-R4	B5925	Trace VOC		7/23/2009
	GWM-06-4-R4	B5926	Trace VOC		7/23/2009
	GWM-06-5-R4	B5927	Trace VOC		7/23/2009
	GWM-06-6-R4	B5928	Trace VOC		7/23/2009
MW-SVP07	GWM-07-1-R4	B5929	Trace VOC		8/4/2009
	GWM-07-2-R4	B5930	Trace VOC		8/4/2009
	GWM-07-3-R4	B5931	Trace VOC		8/4/2009
	GWM-07-4-R4	B5932	Trace VOC		8/4/2009
	GWM-07-5-R4	B5933	Trace VOC		8/4/2009
	GWM-07-6-R4	B5934	Trace VOC		8/4/2009
MW-SVP08	GWM-08-1-R4	B5935	Trace VOC		7/31/2009
	GWM-08-2-R4	B5936	Trace VOC		7/31/2009
	GWM-08-3-R4	B5937	Trace VOC		7/31/2009
	GWM-08-4-R4	B5938	Trace VOC		7/31/2009
	GWM-08-5-R4	B5939	Trace VOC		7/31/2009
	GWM-08-6-R4	B5940	Trace VOC		7/31/2009
MW-SVP09	GWM-09-10-R4	B5941	Trace VOC		7/27/2009
	GWM-09-1-R4	B5942	Trace VOC		7/27/2009
	GWM-09-2-R4	B5943	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese		7/27/2009
	GWM-09-3-R4	B5944	Trace VOC		7/27/2009
	GWM-09-4-R4	B5945	Trace VOC		7/27/2009
	GWM-09-5-R4	B5946	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese		7/27/2009
	GWM-09-6-R4	B5947	Trace VOC		7/27/2009
	GWM-09-7-R4	B5948	Trace VOC		7/27/2009
	GWM-09-8-R4	B5949	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese	MS/MSD - Metals Only	7/27/2009
	GWM-09-9-R4	B5950	Trace VOC		7/27/2009

Table 2-3

**Summary of Round 4 Multi-port Well, Monitoring Well, and Supply Well Samples**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Well ID	Sample ID	CLP ID	Analysis	QA/QC	Collection/ Shipment Date
MW-SVP10	GWM-10-10-R4	B5951	Trace VOC		8/3/2009
	GWM-10-1-R4	B5952	Trace VOC		8/3/2009
	GWM-10-2-R4	B5953	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese		8/3/2009
	GWM-10-3-R4	B5954	Trace VOC		8/3/2009
	GWM-10-4-R4	B5955	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese		8/3/2009
	GWM-10-5-R4	B5956	Trace VOC		8/3/2009
	GWM-110-5-R4	B5961	Trace VOC	Duplicate of GWM-10-5-R4	8/3/2009
	GWM-10-6-R4	B5957	Trace VOC		8/3/2009
	GWM-10-7-R4	B5958	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese		8/3/2009
	GWM-10-8-R4	B5959	Trace VOC		8/3/2009
	GWM-10-9-R4	B5960	Trace VOC		8/3/2009
MW-SVP11	GWM-11-10-R4	B5962	Trace VOC		7/30/2009
	GWM-11-1-R4	B5963	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness		7/30/2009
	GWM-11-2-R4	B5964	TRACE LDL VOC		7/30/2009
	GWM-11-3-R4	B5965	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness		7/30/2009
	GWM-111-3-R4	B5972	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness	Duplicate of GWM-11-3-R4	7/30/2009
	GWM-11-4-R4	B5966	Trace VOC		7/30/2009
	GWM-11-5-R4	B5967	Trace VOC		7/30/2009
	GWM-11-6-R4	B5968	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness		7/30/2009
	GWM-11-7-R4	B5969	Trace VOC		7/30/2009
	GWM-11-8-R4	B5970	Trace VOC		7/30/2009
	GWM-11-9-R4	B5971	Trace VOC		7/30/2009

Table 2-3

**Summary of Round 4 Multi-port Well, Monitoring Well, and Supply Well Samples**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Well ID	Sample ID	CLP ID	Analysis	QA/QC	Collection/ Shipment Date
MW-SVP12	GWM-12-1-R4	B5975	Trace VOC		7/29/2009
	GWM-112-1-R4	B5973	Trace VOC	Duplicate of GWM-12-1-R4	7/29/2009
	GWM-12-2-R4	B5976	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness, TAL Metals		7/29/2009
	GWM-12-3-R4	B5977	Trace VOCs		7/29/2009
	GWM-12-4-R4	B5978	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness, TAL Metals		7/29/2009
	GWM-12-5-R4	B5979	Trace VOCs		7/29/2009
	GWM-12-6-R4	B5980	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness, TAL Metals		7/29/2009
	GWM-112-6-R4	B5974	TRACE LDL VOC and TAL Metals	Duplicate of GWM-12-6-R4	7/29/2009
MW-SVP13	GWM-13-1-R4	B5981	Trace VOCs		7/28/2009
	GWM-13-2-R4	B5982	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness, TAL Metals		7/28/2009
	GWM-13-3-R4	B5983	Trace VOC		7/28/2009
	GWM-13-4-R4	B5984	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness, TAL Metals		7/28/2009
	GWM-13-5-R4	B5985	Trace VOC		7/28/2009
	GWM-13-6-R4	B5986	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese, TDS, TSS, ammonia, TKN, hardness, TAL Metals	MS/MSD - TAL Metals Only	7/28/2009
Garden City Supply Well #10	GWP-10-R4	B5987	Trace VOC		7/30/2009
Garden City Supply Well #11	GWP-11-R4	B5988	Trace VOC		7/30/2009
N-10019	GWX-10019-R4	B5990	TRACE LDL VOCs, Filtered and Unfiltered Iron and Manganese		7/24/2009
	GWX-10019D-R4	B5989	Trace VOC	Duplicate of GWX-10019-R4	7/24/2009
N-10020	GWX-10020-R4	B5991	Trace VOC		7/24/2009
N-8068	GWX-8068-R4	B59A2	Trace VOC		

**Table 2-3**

**Summary of Round 4 Multi-port Well, Monitoring Well, and Supply Well Samples**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Well ID	Sample ID	CLP ID	Analysis	QA/QC	Collection/ Shipment Date
Trip Blanks	TB072209	B5992	Trace VOC	Trip Blank	7/22/2009
	TB072309	B5993	Trace VOC	Trip Blank	7/23/2009
	TB072409	B5994	Trace VOC	Trip Blank	7/24/2009
	TB072709	B5995	Trace VOC	Trip Blank	7/27/2009
	TB072809	B5996	Trace VOC	Trip Blank	7/28/2009
	TB072909	B5997	Trace VOC	Trip Blank	7/29/2009
	TB073009	B5998	Trace VOC	Trip Blank	7/30/2009
	TB073109	B5999	Trace VOC	Trip Blank	7/31/2009
	TB080309	B59A0	Trace VOC	Trip Blank	8/3/2009
	TB080409	B59A1	Trace VOC	Trip Blank	8/4/2009
Field Blanks	FB072209	B59A3	Trace VOC	Field Blank	7/22/2009
	FB072309	B59A4	Trace VOC	Field Blank	7/23/2009
	FB072409	B59A5	Trace VOC	Field Blank	7/24/2009
	FB072709	B59A6	Trace VOC	Field Blank	7/27/2009
	FB072809	B59A7	Trace VOC	Field Blank	7/28/2009
	FB072909	B59A8	Trace VOC	Field Blank	7/29/2009
	FB073009	B59A9	Trace VOC	Field Blank	7/30/2009
	FB073109	B59B0	Trace VOC	Field Blank	7/31/2009
	FB080309	B59B1	Trace VOC	Field Blank	8/3/2009
	FB080409	B59B2	Trace VOC	Field Blank	8/4/2009

Notes:

\*Bottles for GWM-02-4-R4 were broken; the port was re-sampled.

LDL VOCs = low detection limit volatile organic compounds

TDS = total dissolved solids

TSS = total suspended solids

TKN = total Kjeldahl nitrogen

TAL = target analyte list

Table 3-4

**Site-related VOC Results - Round 4**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Port #	MW-SVP01				
	PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
Port 10	ND	ND	ND	ND	ND
Port 9	ND	ND	ND	ND	ND
Port 8	ND	ND	ND	ND	ND
Port 7	ND	ND	ND	ND	ND
Port 6	ND	ND	ND	ND	ND
Port 5	0.36 J	0.35 J	ND	ND	ND
Port 4	0.47 J	0.37 J	ND	ND	ND
Port 3	0.65	0.92	1.2 J	ND	ND
Port 2	0.4 J	0.7	1.4	ND	ND
Port 1	ND	0.61	0.56	ND	ND

Port #	MW-SVP02				
	PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
Port 10	ND	0.93	ND	ND	ND
Port 9	ND	39	ND	0.75 J	ND
Port 8	2.4 J	18 J	ND	0.41 J	ND
Port 7	2.8	12	ND	0.5	ND
Port 6	3.8	19	ND	5	ND
Port 5	3.9 J	23	ND	4.6	ND
Port 4	5.4	21 J	ND	5.2 J	ND
Port 3	3.6	18	ND	2.9	ND
Port 2	3.1	14	ND	2	ND
Port 1	1.5	15	ND	1	ND

Port #	MW-SVP03				
	PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
Port 10					
Port 9					
Port 8					
Port 7	0.32 J	ND	ND	ND	ND
Port 6	0.49 J	ND	ND	ND	ND
Port 5	0.38 J	0.86	ND	ND	ND
Port 4	0.29 J	0.72	ND	ND	ND
Port 3	ND	19	0.72	ND	ND
Port 2	ND	30	1.1	0.46 J	ND
Port 1	ND	8.3	0.74	ND	ND

GWX-8068				
PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
420	76	11 J	4 J	0.45 J

GWX-10019				
PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
ND / ND	3.1 / 2.9	ND / ND	5.1 / 4.8	ND / ND

GWX-10020				
PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
ND	ND	ND	ND	ND

GWP-10				
PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
150	42	3	2	ND

GWP-11				
PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
91	60	2.3	7.9	ND

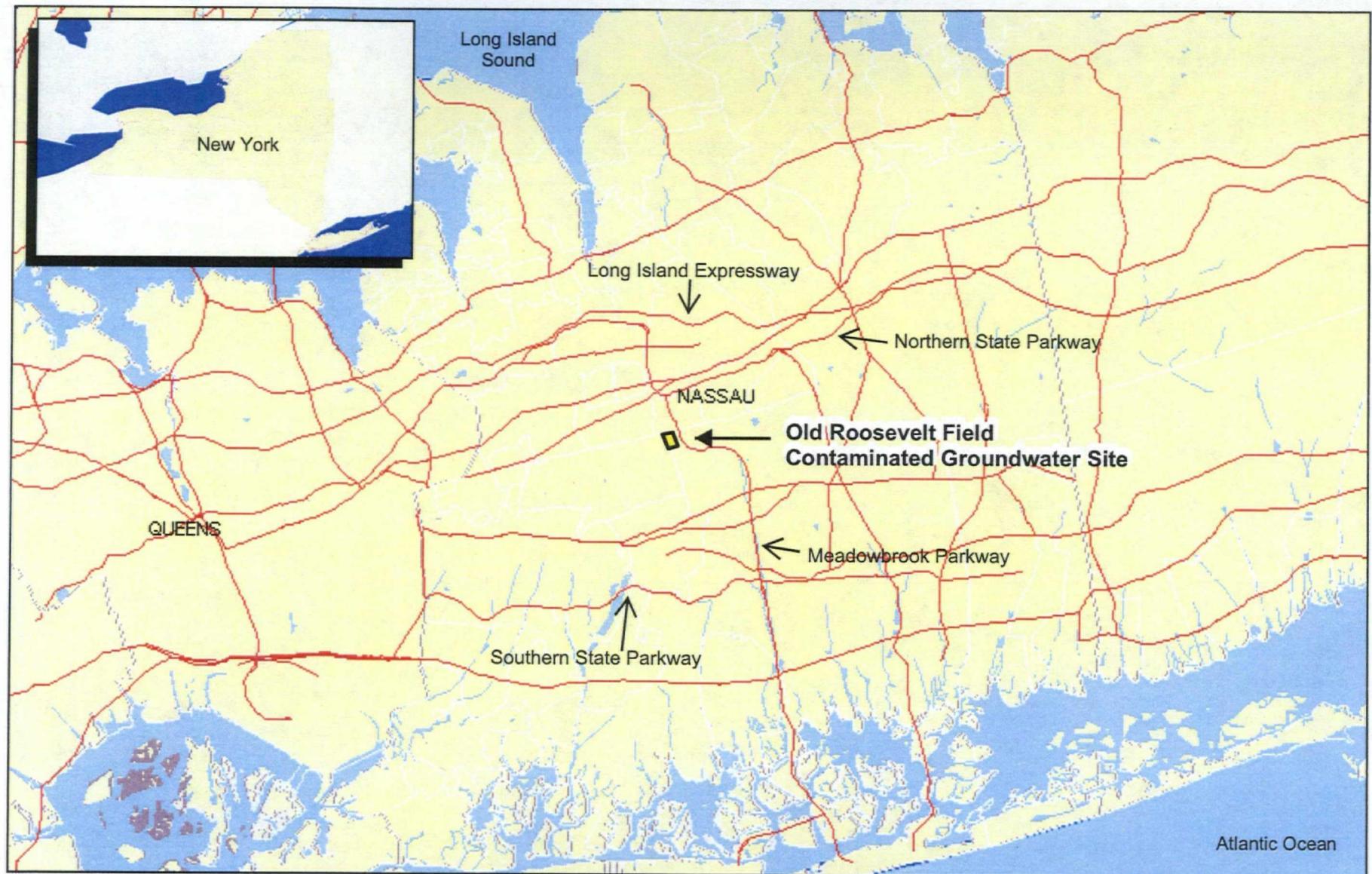
Port #	MW-SVP04				
	PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
Port 10	ND	ND	ND	ND	ND
Port 9	4	1.3	ND	0.26 J	ND
Port 8	10	25	ND	0.45 J	ND
Port 7	10	27	ND	0.66 J	ND
Port 6	120	44	0.58	2.8	ND
Port 5	83 / 91	30 / 34	1.4 / 0.93	2.6 / 2.1	ND / ND
Port 4	100	41	0.92	2.3	ND
Port 3	110	37	1.2	2.9	ND
Port 2	27	13	1	0.87	0.63
Port 1	25	14	1.7	0.91	0.49 J

Port #	MW-SVP05				
	PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
Port 10	ND	ND	ND	ND	ND
Port 9	ND	ND	ND	ND	ND
Port 8	ND	0.83	1.1	ND	ND
Port 7	ND	0.63	ND	ND	ND
Port 6	0.33 J	4.3	ND	0.59	ND
Port 5	0.33 J	6.1	ND	0.52	ND
Port 4	0.35 J	7.7	ND	0.52	ND
Port 3	0.62	4	ND	0.37 J	ND
Port 2	1	43	ND	1.6 J	1 J
Port 1	ND	4	ND	0.45 J	0.25 J

Port #	MW-SVP08				
	PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
Port 6	ND	ND	ND	ND	ND
Port 5	0.29 J	0.38 J	ND	ND	ND
Port 4	ND	ND	ND	ND	ND
Port 3	5.6	14	0.27 J	0.99	ND
Port 2	13	30	23	1.1 J	ND
Port 1	13	15	13 J	0.3 J	ND

Port #	MW-SVP06				
	PCE	TCE	1,1-DCE	cis-1,2-DCE	CT
Port 6	ND	ND	ND	ND	ND
Port 5	ND	2.7	6.6 J	15 J	ND
Port 4	ND	0.57	0.98 J	2.6 J	ND
Port 3	ND	1.1	0.5		

# Figures



adapted from NYSDEC Interactive Mapping Gateway: <http://www.nygis.state.ny.us/gateway/index.html>

**CDM**

**Figure 1-1**  
**Site Location Map**  
Old Roosevelt Field Contaminated Groundwater Site  
Garden City, New York



adapted from NY SDEC Interactive Mapping Gateway: <http://www.nygis.state.ny.us/gateway/index.html>

**CDM**

0.25    0.125    0    0.25 Miles

**Figure 1-2**  
**Site Map**  
Old Roosevelt Field Contaminated Groundwater Site  
Garden City, New York



- Municipal Pumping Well
- Existing RI Multi-port Well
- Existing Conventional Well
- ✖ Existing RD Multi-port Well
- △ New RD Multi-port Well

0 350 700 1,400 Feet

Figure 2-1  
Round 4 Multi-port Well, Monitoring Well,  
and Supply Well Locations  
Old Roosevelt Field Contaminated Groundwater Site  
Garden City, New York

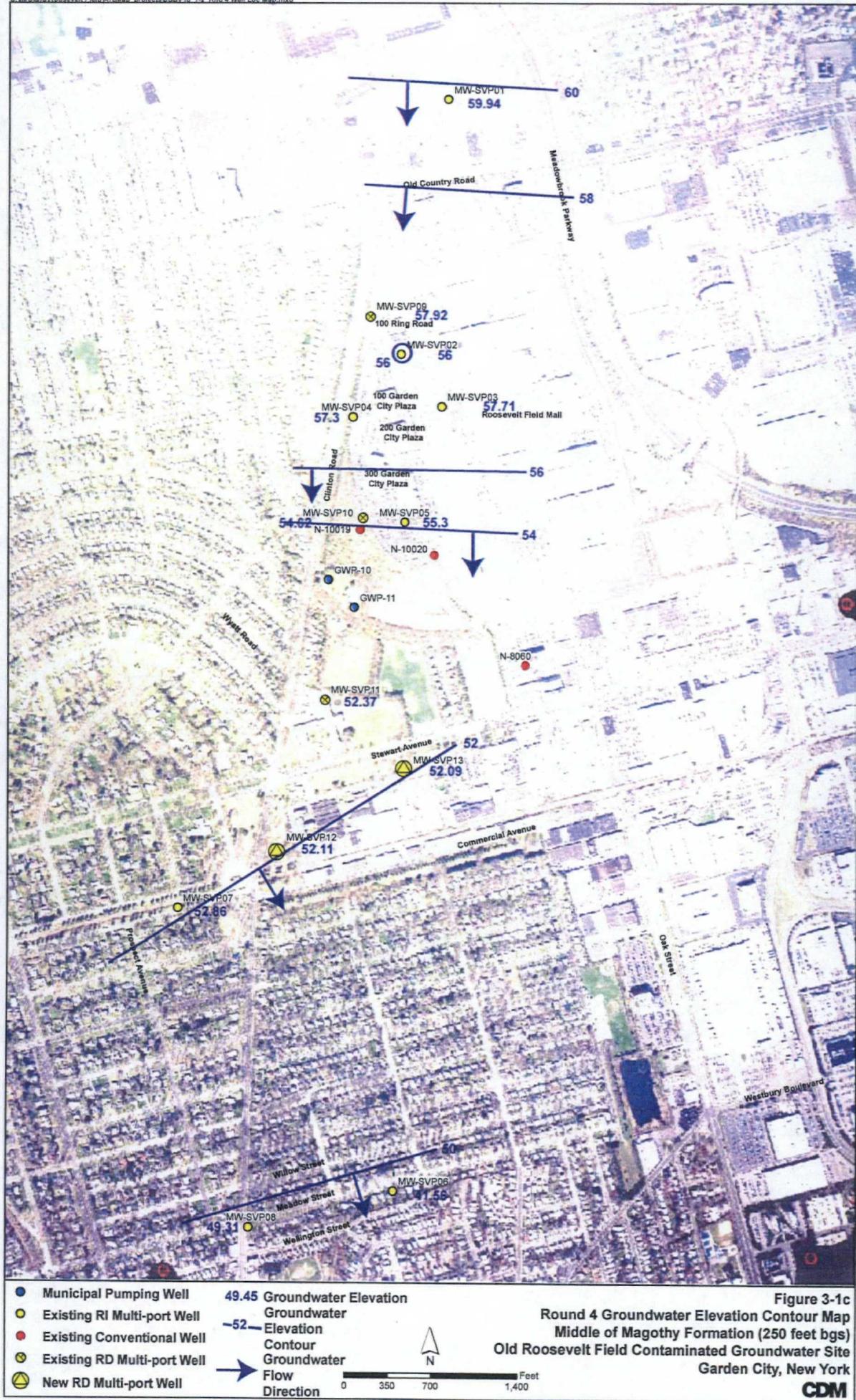
CDM



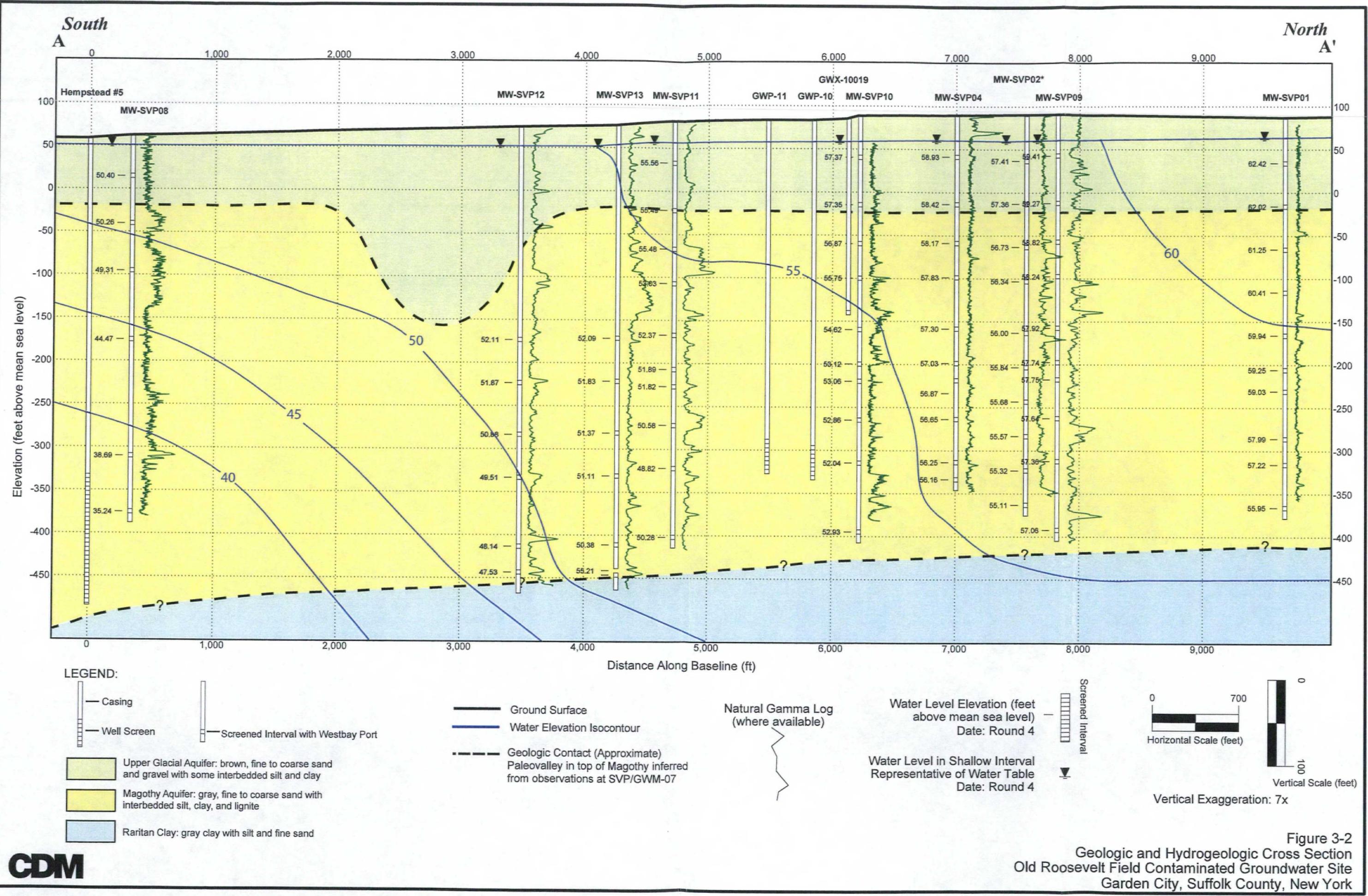
Figure 3-1a  
Round 4 Groundwater Elevation Contour Map  
Water Table (50 feet bgs)  
Old Roosevelt Field Contaminated Groundwater Site  
Garden City, New York

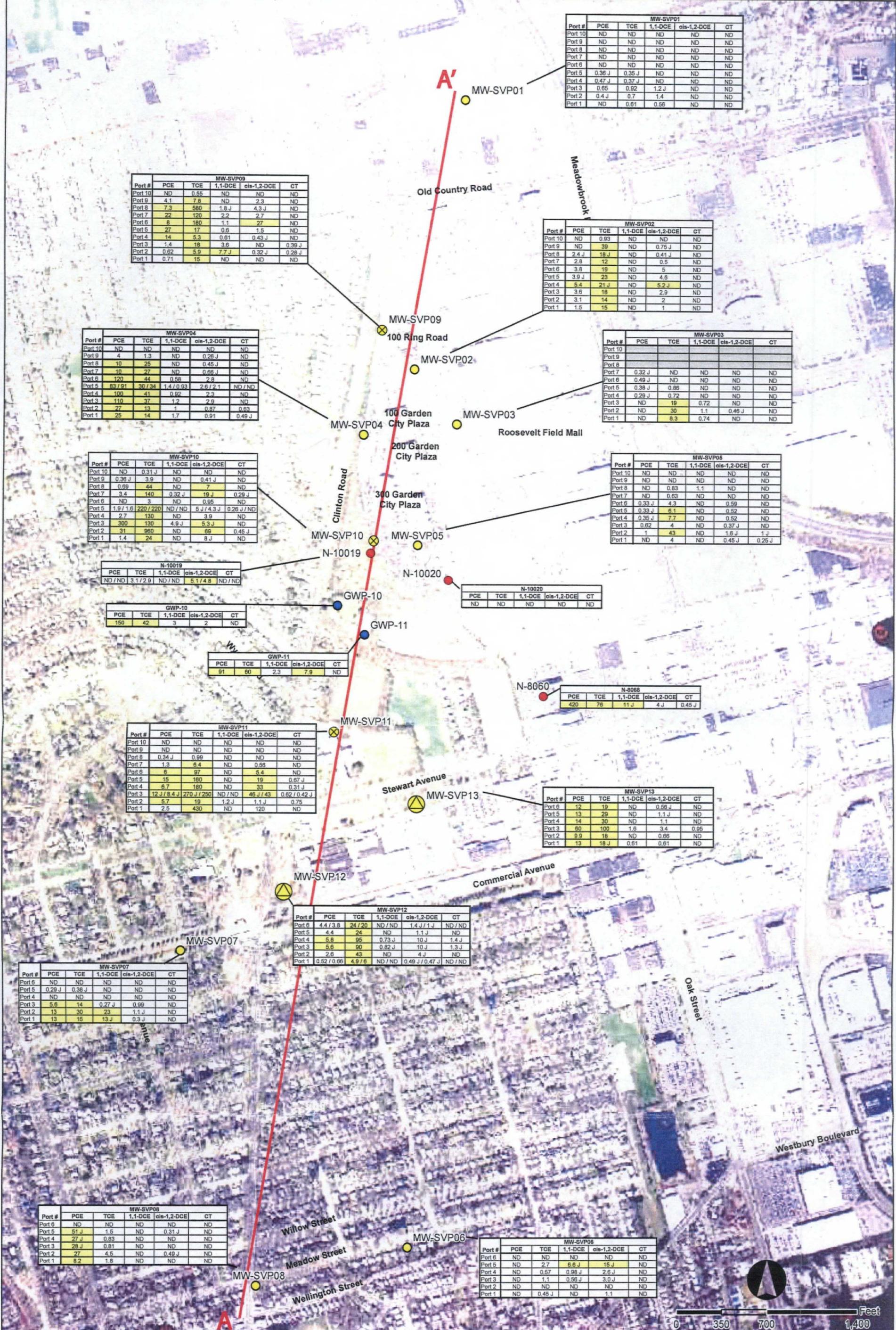
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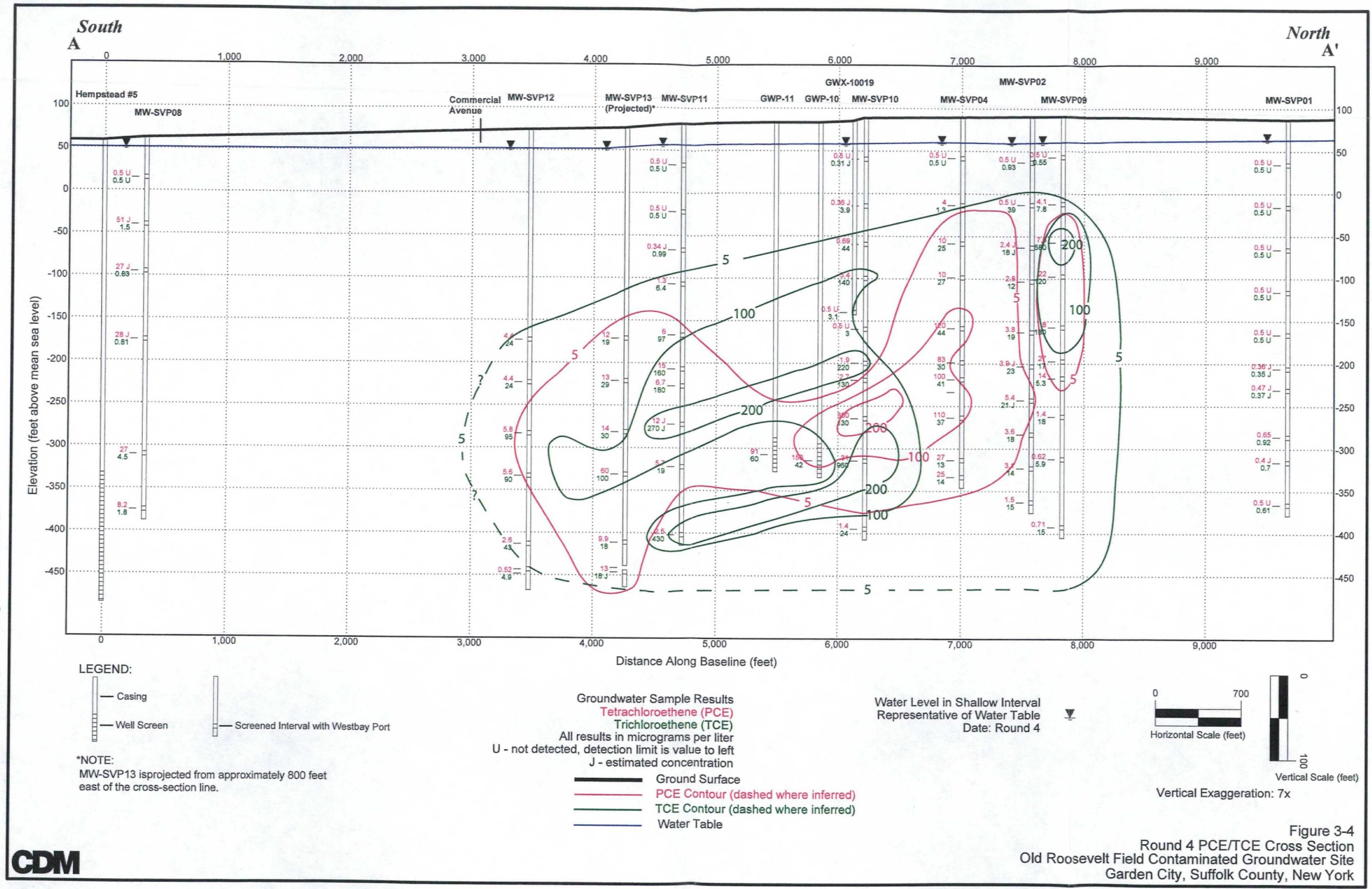


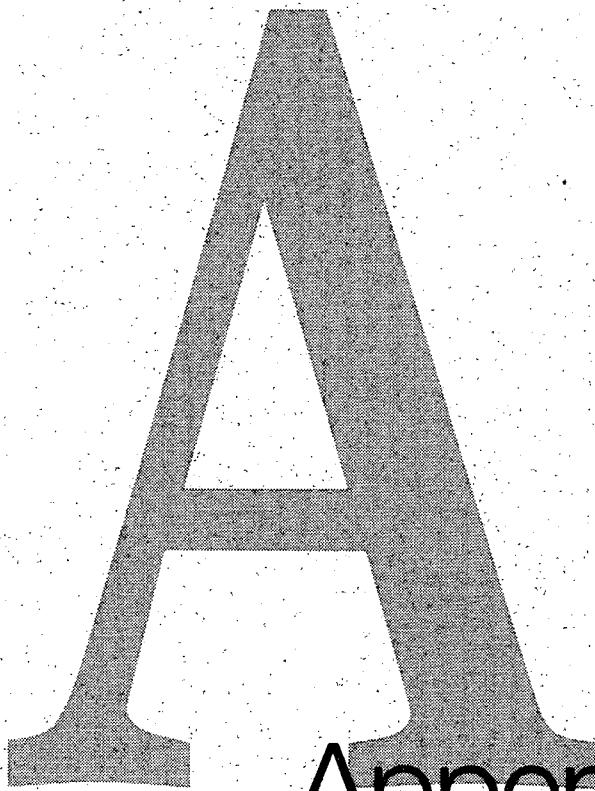
- Municipal Pumping Well
- Existing RI Multi-port Well
- Existing Conventional Well
- Existing RD Multi-port Well
- New RD Multi-port Well
- Cross-Section Line

Notes:  
 PCE = tetrachloroethylene  
 TCE = trichloroethene  
 1,1-DCE = 1,1-dichloroethene  
 cis-1,2-DCE = cis-1,2-dichloroethene  
 CT = carbon tetrachloride  
 ND = non detect  
 J = estimated result

All results in micrograms per liter (ug/L)  
 Highlighted values exceed screening criteria (screening criteria for all five contaminants is 5 ug/L)  
 Duplicate results are posted next to sample results, separated by a slash (i.e. result / duplicate result)

**Figure 3-3**  
**Round 4 Groundwater PCE/TCE Results**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**





## Appendix A

**Appendix A**

**Field Change Request Forms**

# CDM

125 Malden Lane, 5th Floor  
New York, New York 10038

September 18, 2009

Mr. William Sy  
EPA QA Officer for RAC II  
U.S. Environmental Protection Agency  
2890 Woodbridge Avenue  
Edison, New Jersey 08837

PROJECT: RAC 2 Contract No.: EP-W-09-002  
Work Assignment No.: 008-RDRD-02PE

DOCUMENT No.: 3320-008-00106

SUBJECT: Field Change Request Forms #6 and #7  
Remedial Design Investigation  
Old Roosevelt Field Contaminated Groundwater Area Site  
Garden City, New York

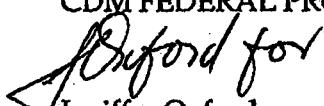
Dear Mr. Sy:

CDM Federal Programs Corporation (CDM) is pleased to submit the following Field Change Request Forms for the Remedial Design Investigation Sampling Activities at the Lawrence Aviation Industries Site, Port Jefferson Station, New York, titled: #6 - *Change to Sand Size in Bentonite Slurry*, and #7 - *Change to Well Development Method for SVP-12 and SVP-13*.

If you have any questions regarding this submittal, please contact me at (212) 377-4536.

Very truly yours,

CDM FEDERAL PROGRAMS CORPORATION

  
Jeniffer Oxford

RAC2 QA Coordinator

Enclosure

cc: F. Rosado, EPA (Letter Only)  
C. Kwan, EPA  
L. Campbell, CDM

J. Litwin, CDM (Letter Only)  
S. Schofield, CDM  
RAC II Document Control



**Old Roosevelt Field Contaminated Groundwater Area Site  
Remedial Design  
Garden City, NY**

**Field Change Request**

**Date:** June 10, 2009

**Request No.:** 6

**FCR Title:** Change to Sand Size in Bentonite Slurry

**Description:** The QAPP Addendum specifies that the bentonite slurry shall consist of bentonite mixed with #3 size sand. The #3 size sand is coarser grained and heavier than typical sand used by drillers for well installation. CDM and the drilling subcontractor would like to substitute #1 or #00 size sand for use in the bentonite slurry mixture.

**Reason for Deviation:** The use of #3 size sand in the bentonite slurry mixture causes the sand to fall to the bottom of the slurry when it is placed into the borehole annulus; therefore, sand is not uniform within vertical interval of the slurry. Additionally, significant time is needed to add sand to the bentonite slurry to bring the slurry up to the appropriate depth in the borehole annulus. Replacing the #3 sand with a smaller size sand (#1 and #00) will ensure better uniform mixing of the sand in the slurry.

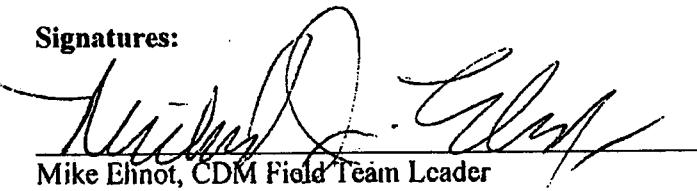
**Recommended/Modification:** Use #1 or #00 size sand in the bentonite slurry mixture instead of the specified #3 size sand. The finer grained #1 or #00 size sand will mix better within the bentonite slurry and form a "denser" seal material.

**Impact on Data Quality Objectives:** Data quality objectives will be enhanced because the #1 or #00 size sand added to the bentonite slurry will create a "uniform" seal because the sand will be present throughout the slurry.

**RAC II Contract No.:** EP-W-09-002

**Work Assignment No.:** 008-RDRD-02PE

**Signatures:**

  
Mike Ehnot, CDM Field Team Leader

---

Susan Schofield, CDM Project Manager

cc:

Caroline Kwan, EPA Remedial Project Manager

Susan Schofield, CDM Project Manager

Lisa Campbell, CDM PRDI Task Manager

Mike Ehnot, CDM Field Team Leader

Jeniffer Oxford, CDM Quality Assurance Coordinator

Roosevelt Field PRDI Field Team

**Old Roosevelt Field Contaminated Groundwater Area Site**  
**Remedial Design**  
**Garden City, NY**

**Field Change Request**

**Date:** June 17, 2009

**Request No.:** 7

**FCR Title:** Change to Well Development Method for SVP-12 and SVP-13

**Description:** The method of developing the outer casing screen intervals for SVP-12 and SVP-13 will be changed from the packer/pump method used previously at the site, to the air-lift/swab method.

**Reason for Deviation:** The air-lift/swab method of well development consists of alternating air-lifting (pulling water from the formation through the sandpack and screen) and swabbing (pushing water inside the well out through the screen and sandpack), resulting in a reversal of flow through the screen and sandpack. This method is more thorough in removing drilling mud and fine particles than the packer/pump method, which only pulls water through the sandpack and screen. *Note: Air or aerated water is not introduced into the screen intervals during this method.*

**Recommended/Modification:** Conduct well development of the outer casing screen intervals using the air-lift/swab method. Procedures are described below:

**Air-lifting Portion of Development:**

- An air hose is lowered into the well to a depth between 50-100 feet below the water table
- Compressed air is pumped through the air hose, causing the overlying 50-100-foot water column to be lifted out of the top of the well. As the water level inside the well equilibrates to its original static depth, a vacuum is created in which water is pulled in through the sand pack and screen interval.

**Swabbing Portion of Development**

- A double-swab assembly is lowered into the borehole to the screen interval. The assembly consists of two nominal 4-inch diameter rubber swabs separated by a 10-foot length of pipe.
- The assembly is moved up and down throughout the screen interval, forcing water out through the screen and sand pack as the swabs are lowered, and sucking in water as the swabs are raised.

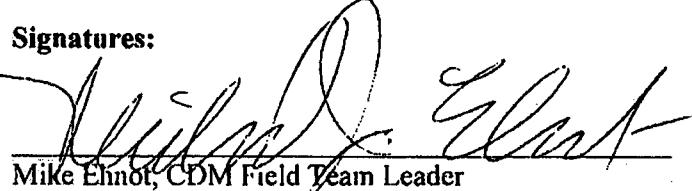
Water quality parameters (temperature, conductivity, turbidity, DO, and pH) will be measured from an in-line port along the discharge pipe. At each screen zone, air-lifting and swabbing will be alternated until water is clear after swabbing and water quality parameters have stabilized to within 10 percent. Purge water will be containerized and transported to the onsite Baker tank for waste characterization.

**Impact on Data Quality Objectives:** Data quality objectives will not be adversely affected. Rather, the change will result in more thorough development of the wells and more representative groundwater samples.

**RAC II Contract No.:** EP-W-09-002

**Work Assignment No.:** 008-RDRD-02PE

**Signatures:**



Mike Ehnert, CDM Field Team Leader

Susan Schofield, CDM Project Manager

cc:

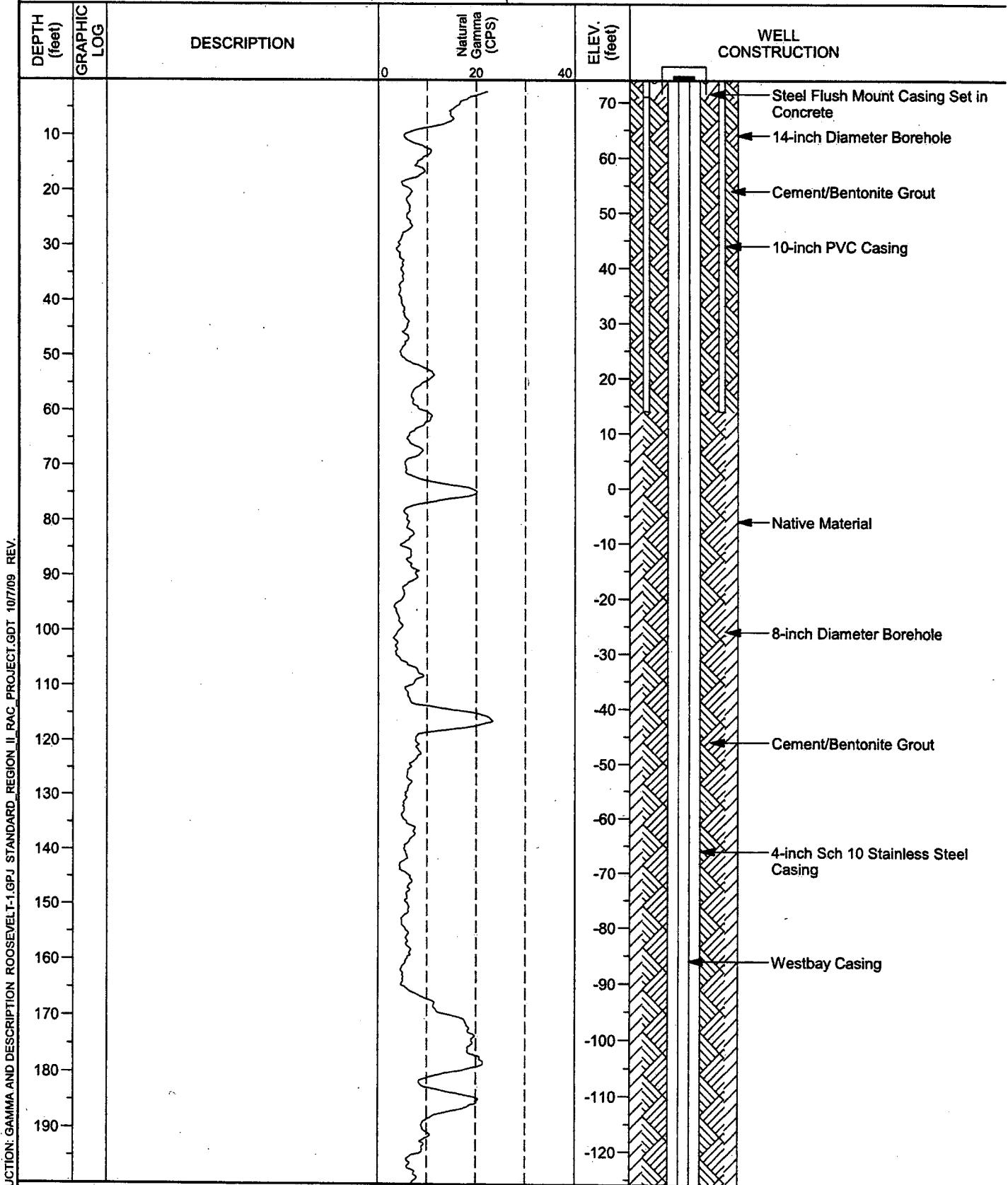
Caroline Kwan, EPA Remedial Project Manager  
Susan Schofield, CDM Project Manager  
Lisa Campbell, CDM PRDI Task Manager  
Mike Ehnot, CDM Field Team Leader  
Jeniffer Oxford, CDM Quality Assurance Coordinator  
Roosevelt Field PRDI Field Team

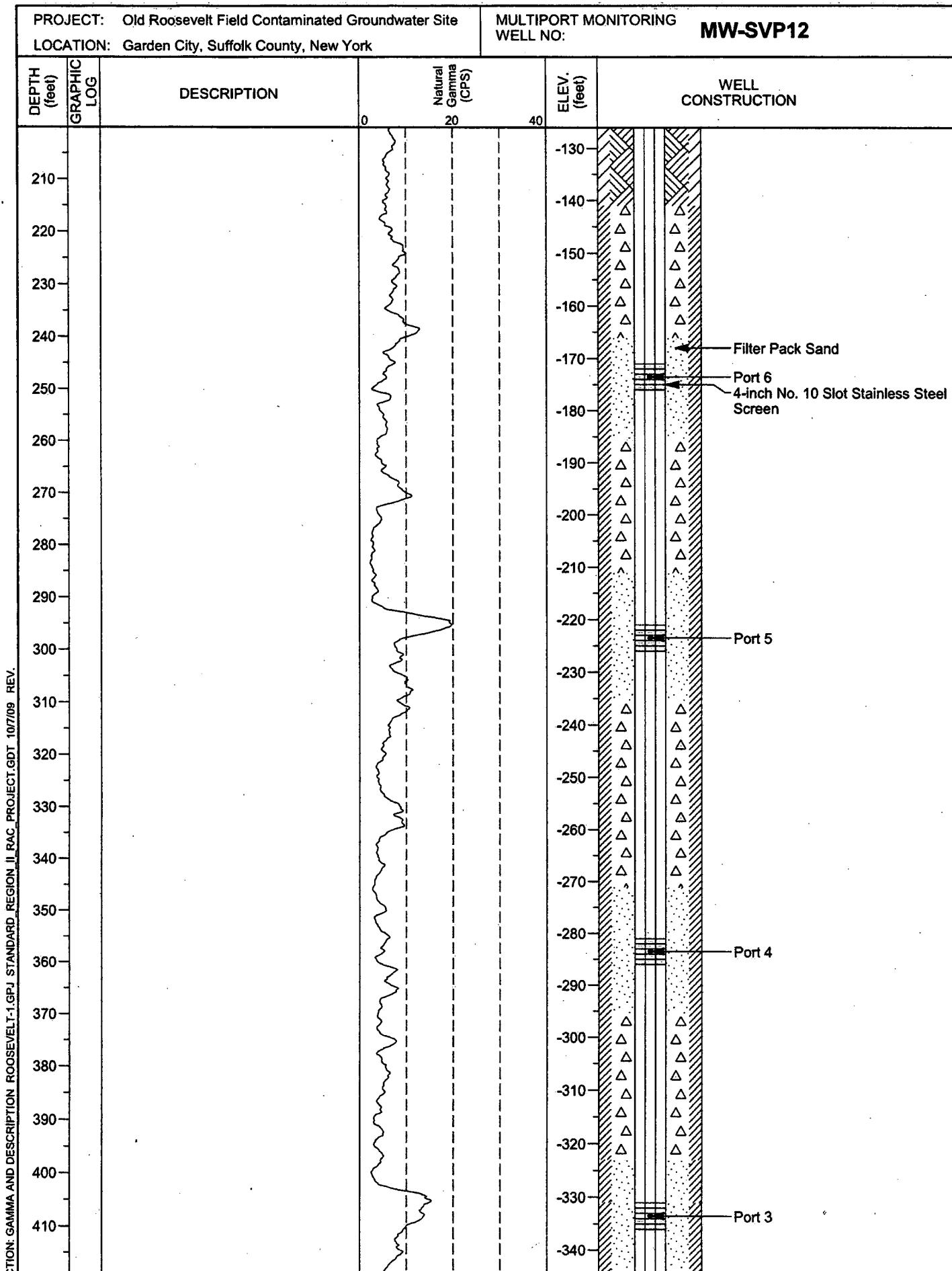
# APPENDIX B

Appendix  
B

**Appendix B**  
**Multi-port Well Construction Diagrams**  
**(new wells only)**

PROJECT: Old Roosevelt Field Contaminated Groundwater Site LOCATION: Garden City, Suffolk County, New York	MULTIPOINT MONITORING WELL NO: MW-SVP12
STARTED: COMPLETED: DRILLING COMPANY: UTD DRILLING EQUIPMENT: DRILLING METHOD: Mud Rotary, In. Dia. Borehole SAMPLING METHOD: SURFACE COMPLETION: Steel Flush-mount	NORTHING: 204860.54 Feet EASTING: 1089717.72 Feet G.S. ELEVATION: 74.06 Feet M.P. ELEV: 75.29 WATER: TOTAL DEPTH: 542.0 Feet LOGGED BY: HORIZONTAL DATUM: NAD83, COORD. SYS.: NY State Plane VERTICAL DATUM: NAVD88





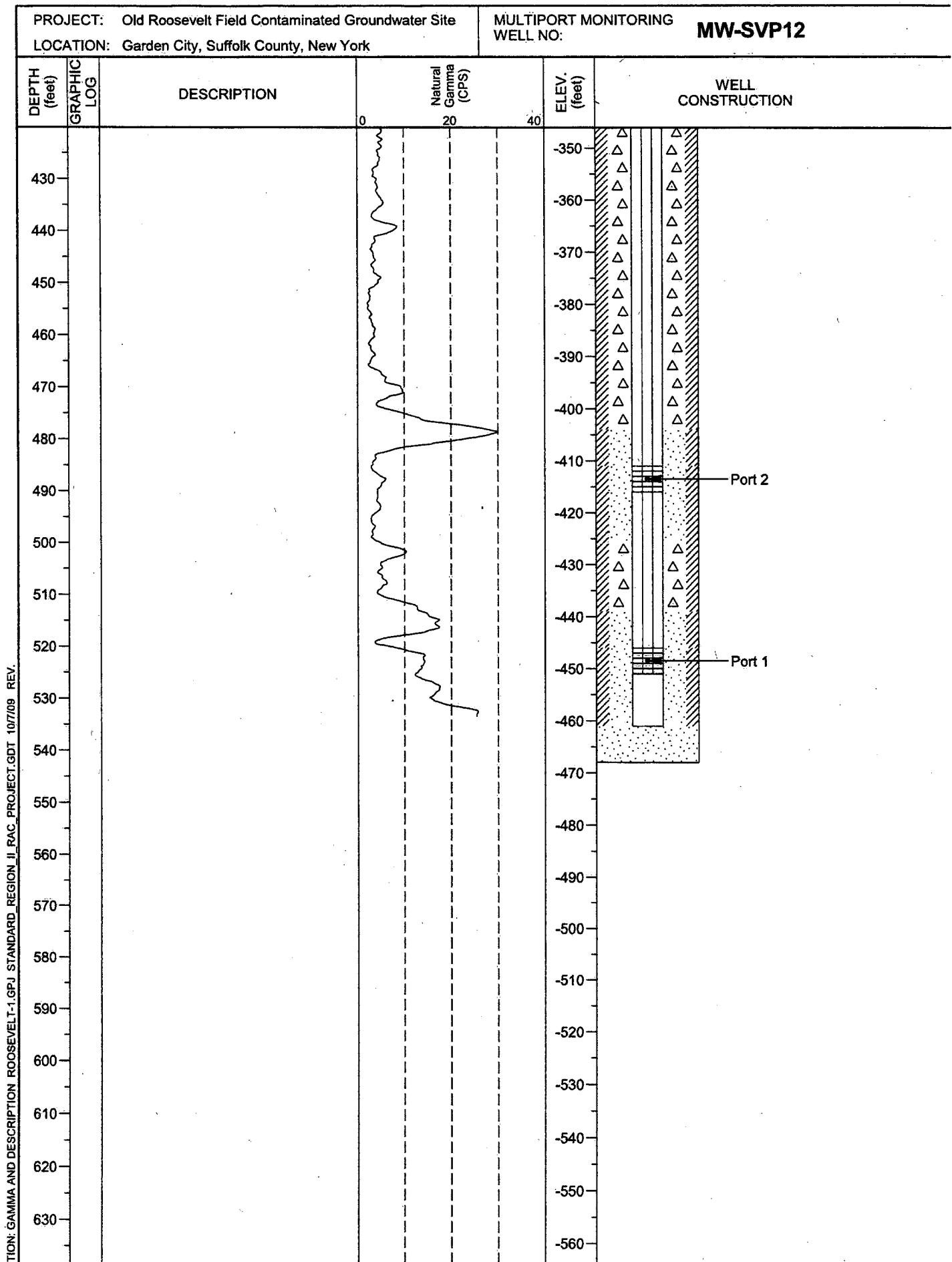
WELL CONSTRUCTION: GAMMA AND DESCRIPTION ROOSEVELT-1-GPJ STANDARD REGION II RAC PROJECT.GDT 10/7/09 REV.

CDM  
Raritan Plaza I, Raritan Center  
Edison, NJ 08818  
Telephone: 732-225-7000  
Fax: 732-225-7851

MULTIPOINT MONITORING WELL  
CONSTRUCTION LOG  
DRAFT

PROJECT NO.



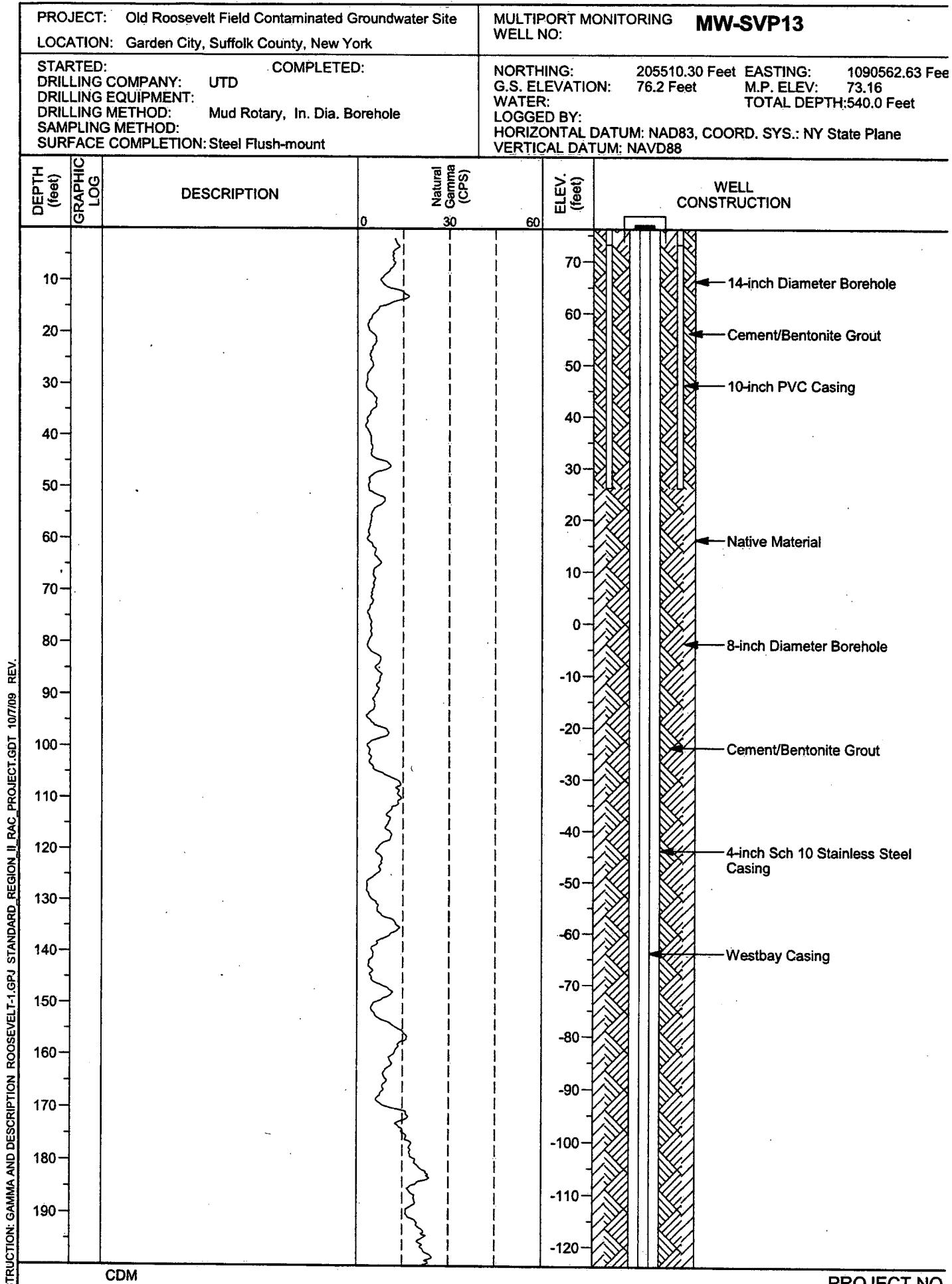


CDM  
Raritan Plaza I, Raritan Center  
Edison, NJ 08818  
Telephone: 732-225-7000  
Fax: 732-225-7851

MULTIPORT MONITORING WELL  
CONSTRUCTION LOG  
DRAFT

PROJECT NO.



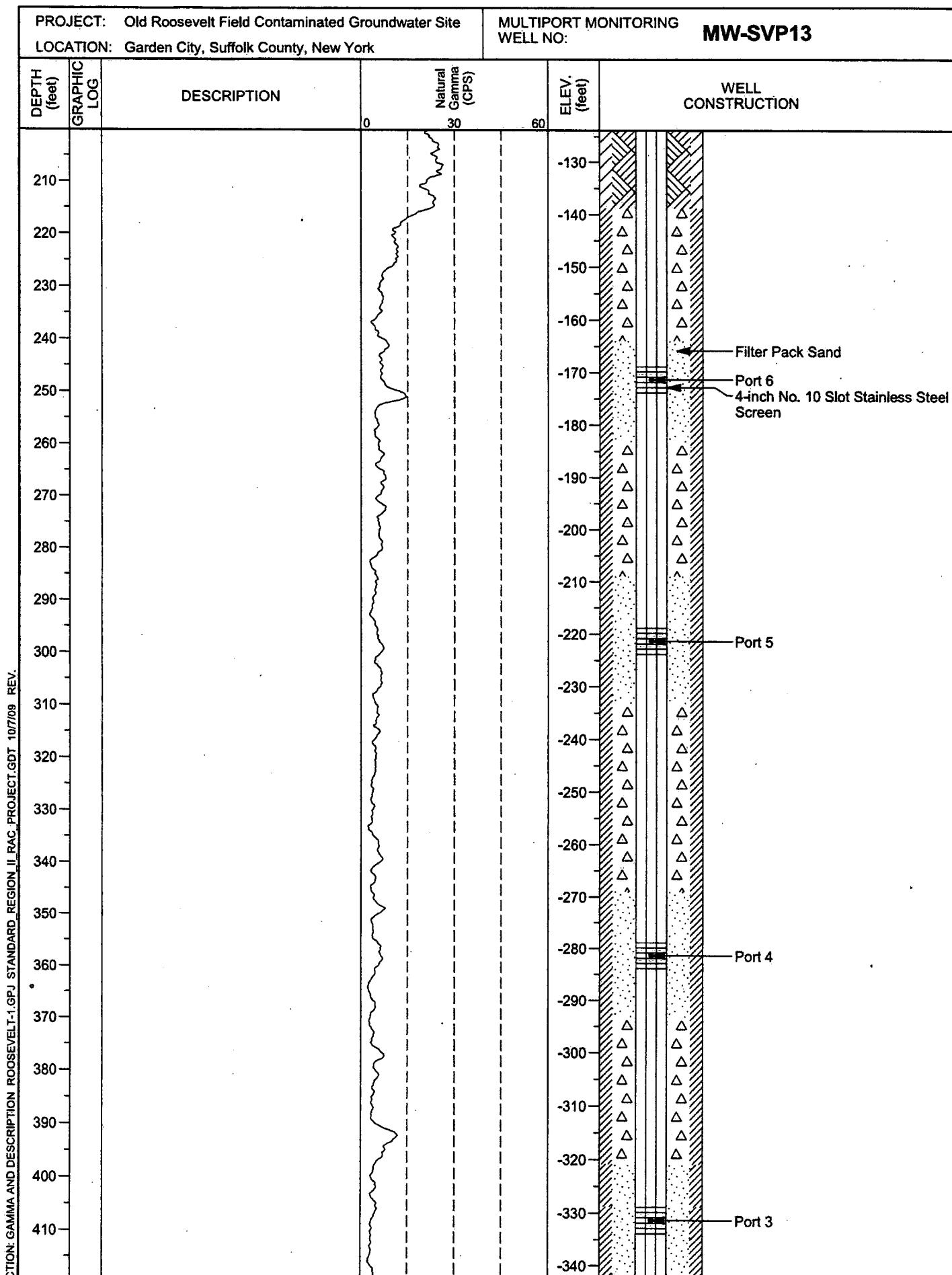


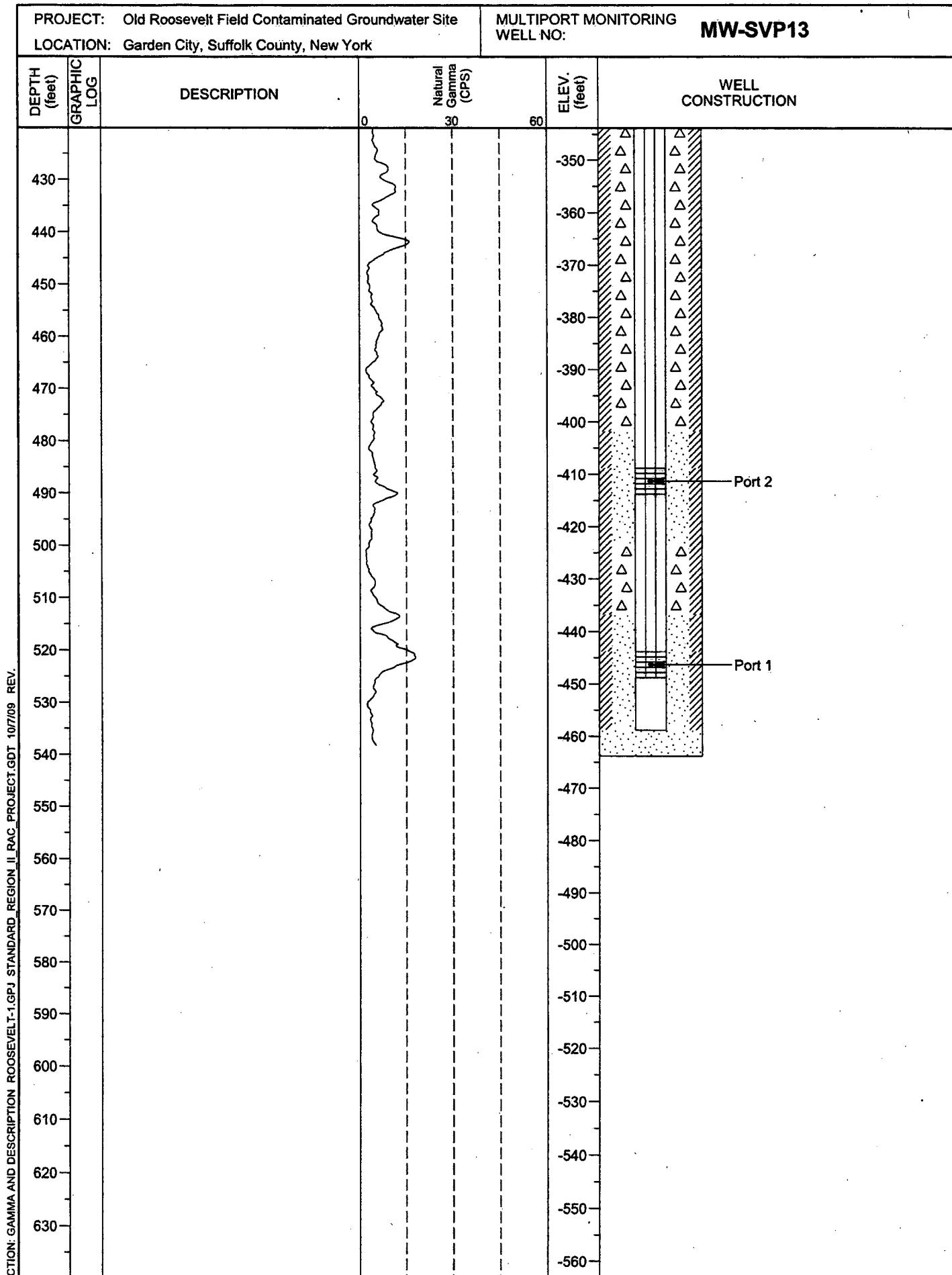
CDM  
Raritan Plaza I, Raritan Center  
Edison, NJ 08818  
Telephone: 732-225-7000  
Fax: 732-225-7851

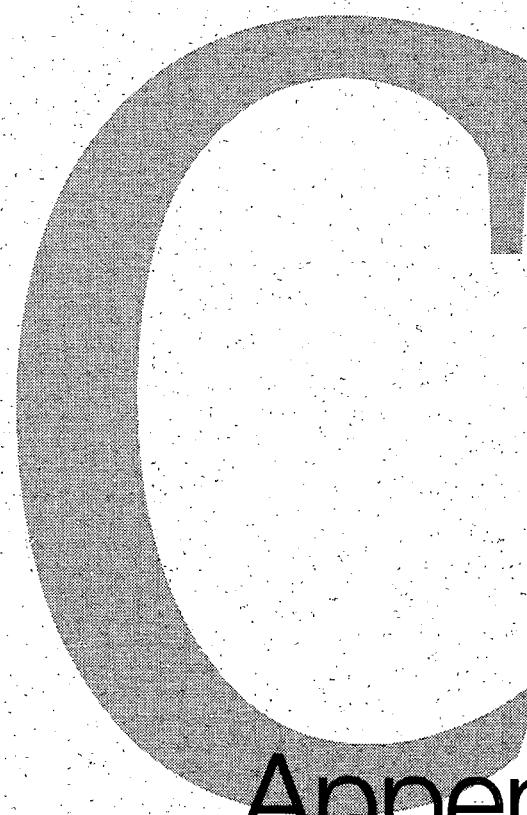
MULTIPORT MONITORING WELL  
CONSTRUCTION LOG  
DRAFT

PROJECT NO.









## Appendix C

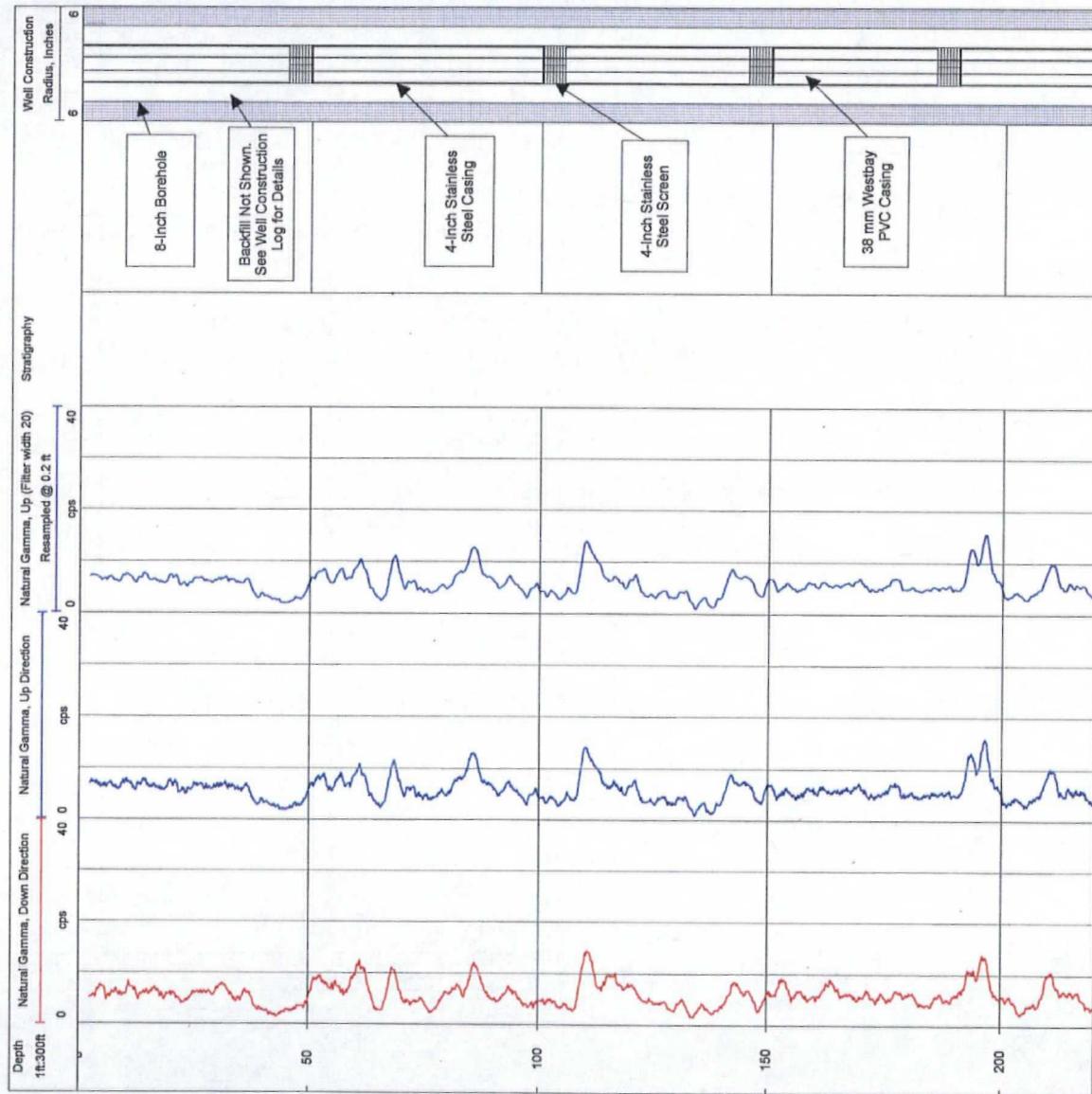
**Appendix C**  
**Natural Gamma Logs**

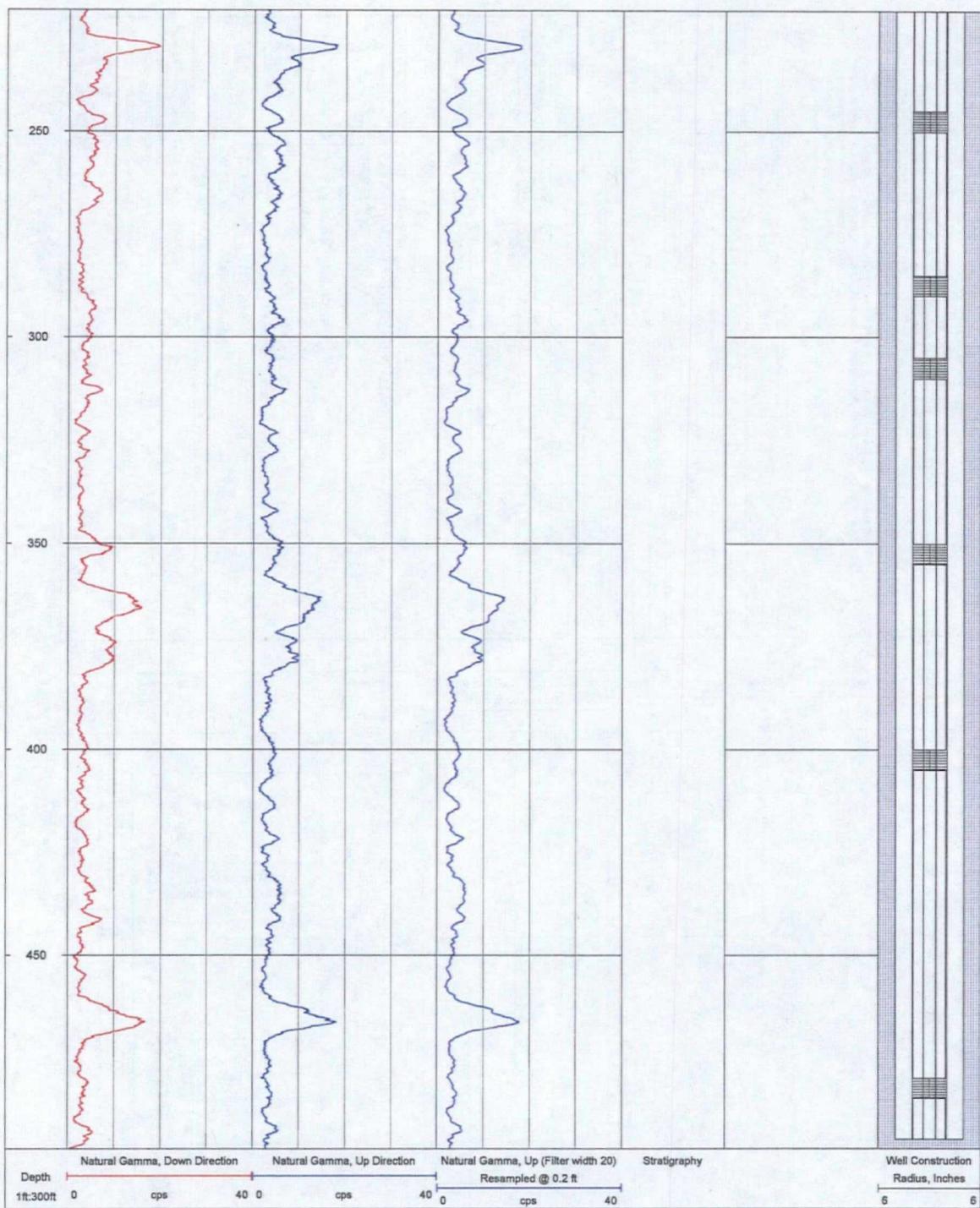


CDM

125 Maiden Lane, 5th Floor  
New York, NY 10038  
Phone: 212-785-9123  
Fax: 212-785-8114

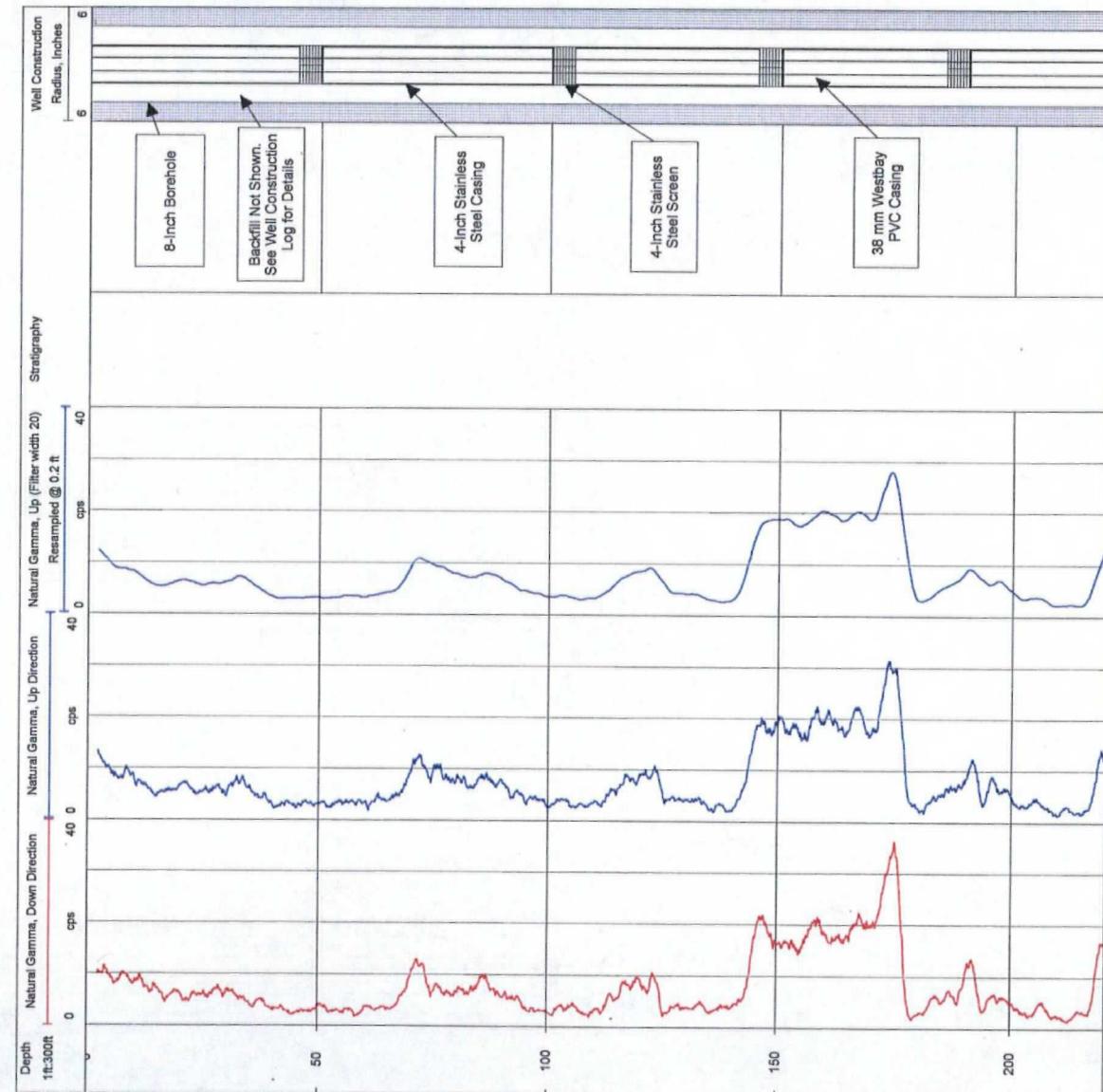
CO	WELL MW-SVP09	LOGGING COMPANY:	CDM
FILD		WELL ID:	MW-SVP09
CTY		CLIENT:	U.S. EPA, REGION II
STE		PROJECT NO.:	50962.68991.3320.008.DAZ.FIELD
FILING No		SITE:	ROOSEVELT FIELD
		LOCATION:	GARDEN CITY
		STATE:	NEW YORK
		EASTING:	
		NORTHING:	
COORDINATE SYSTEM AND DATUM: NYSP			
PERMANENT DATUM:	GROUND SURFACE		ELEVATION:
LOG MEAS. FROM:	0 FEET	ABOVE PERM. DATUM	
DRILLING MEAS. FROM: GROUND SURFACE			G.L.
DATE	1 JULY 2009		TYPE FLUID IN HOLE
RUN No	1 (DOWN) AND 2 (UP)		SALINITY
TYPE LOG	NATURAL GAMMA		DENSITY
DEPTH-DRILLER	500		LEVEL
DEPTH-LOGGER	499.6		MAX. REC. TEMP.
BTM LOGGED INTERVAL	497		LOGGING SPEED
TOP LOGGED INTERVAL	0		INSTRUMENT MAKE
OPERATING RIG TIME			INSTRUMENT MODEL
RECORDED BY	JOE BUTTON		HL2375/I
WITNESSED BY			2397
BOREHOLE RECORD			
RUN NO.	BIT	FROM	TO
1	8-INCH	0	500
CASING AND SCREEN RECORD			
		SIZE	WGT.
		FROM	TO
<p>Notes:</p> <ol style="list-style-type: none"> <li>1. Gamma probe run inside Westbay MP38 multiport well casing.</li> <li>2. Down run started at 15:35. Up run started at 16:20</li> <li>3. Winch: Model 4MGB-1000, side by side, S/N 1303</li> <li>4. Gamma probe sampling rate: 0.1 feet</li> <li>5. The UP log was processed by first applying a moving average filter using WellCAD. A filter width of 20 was used. To reduce the number of data points by roughly 50% the filtered log was resampled using WellCAD using a sampling rate of 0.2 feet. The filtered and resampled log was used in gINT with the complete well construction and lithology log.</li> <li>6. The well construction log only includes well screen and casing for clarity. For backfill information see detailed well construction log.</li> </ol>			

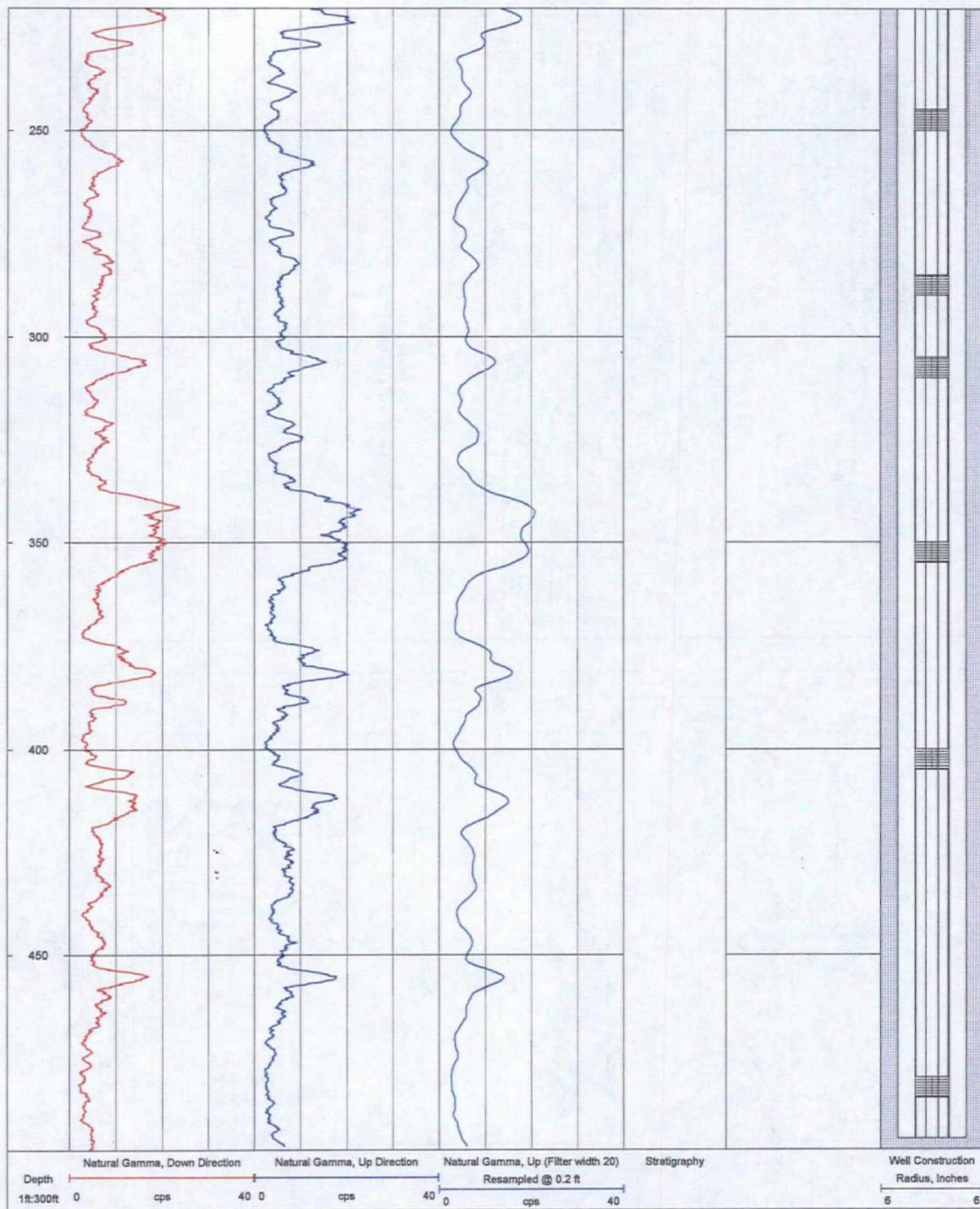






125 Maiden Lane, 5th Floor  
New York, NY 10038  
Phone: 212-785-9123  
Fax: 212-785-6114





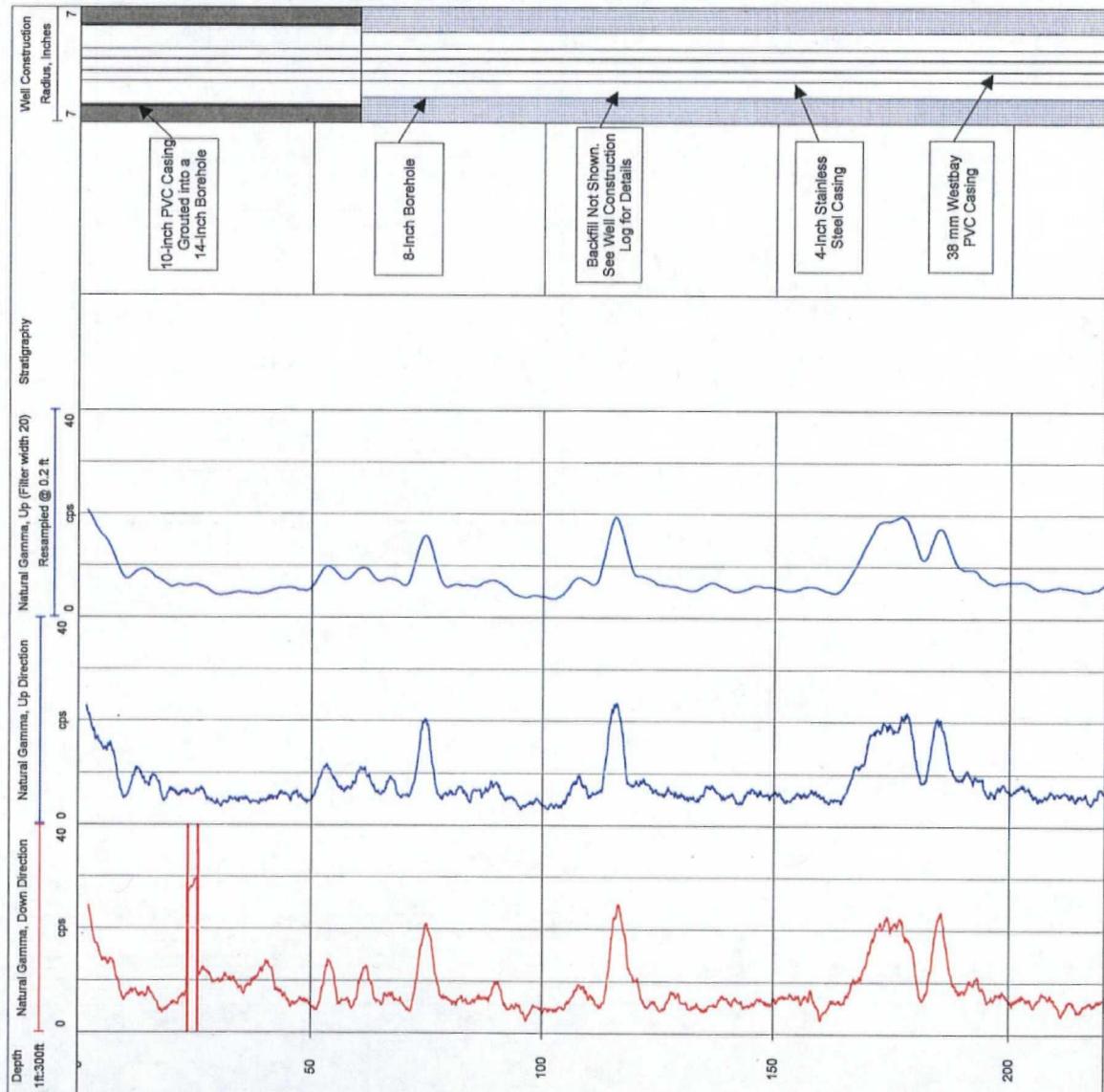
**CDM**

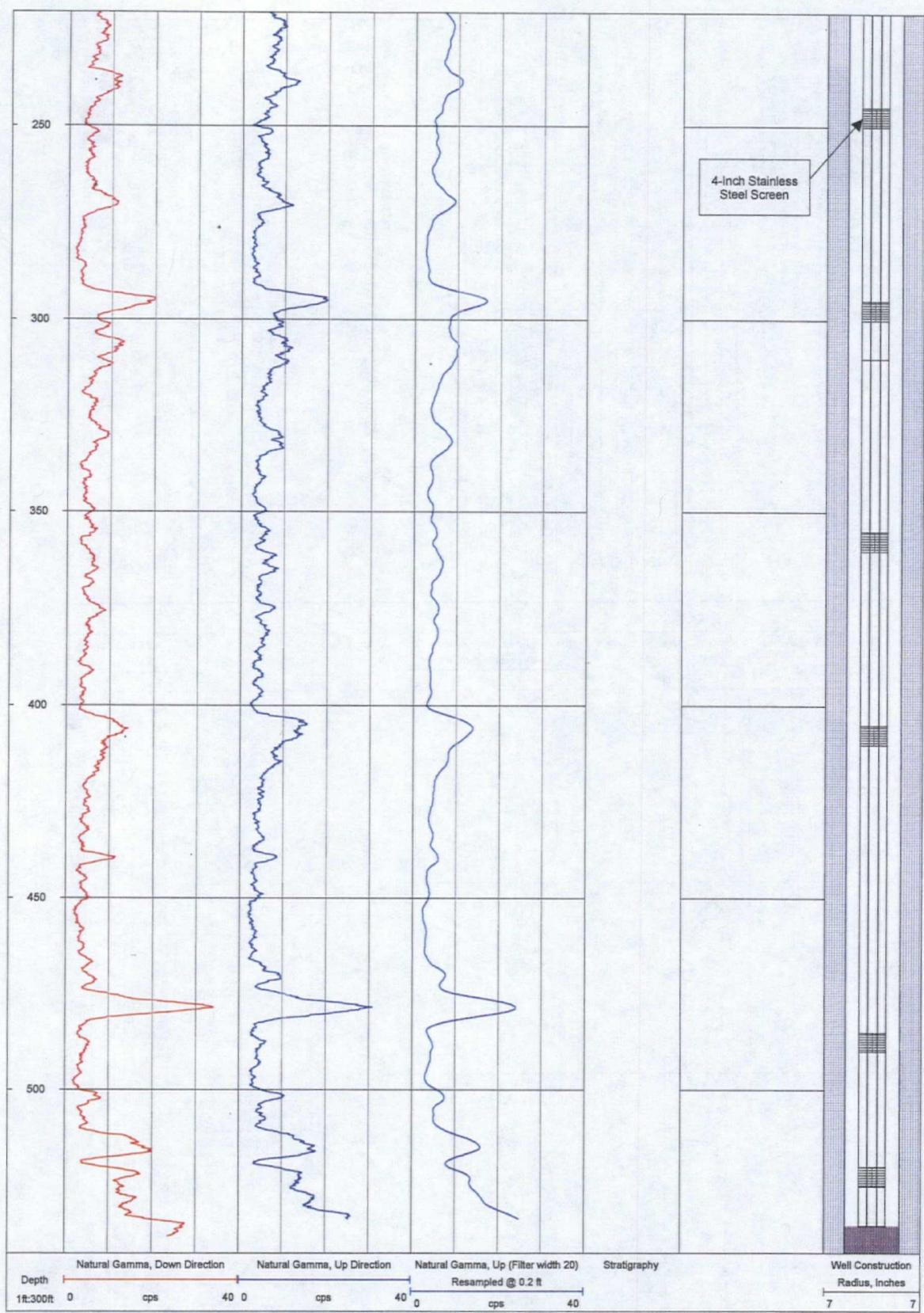
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Phone: 212-785-9123  
Fax: 212-785-6114



CO	WELL MW-SVP12	FID	CITY	STE	FILING No.
LOGGING COMPANY: CDM WELL ID: MW-SVP12 CLIENT: U.S. EPA, REGION II PROJECT NO.: 50962.68991.3320.008.DAZ.FIELD SITE: ROOSEVELT FIELD LOCATION: GARDEN CITY STATE: NEW YORK EASTING: NORTHING: <b>COORDINATE SYSTEM AND DATUM: NYSP</b>					
PERMANENT DATUM: GROUND SURFACE		ELEVATION:		K.B.	N/A
LOG MEAS. FROM: 0 FEET		ABOVE PERM. DATUM		D.F.	N/A
DRILLING MEAS. FROM: GROUND SURFACE					
DATE	7/1/09	TYPE FLUID IN HOLE	WATER		
RUN No	1 (DOWN) AND 2 (UP)	SALINITY			
TYPE LOG	NATURAL GAMMA	DENSITY			
DEPTH-DRILLER	535	LEVEL	24.5 FEET BGS		
DEPTH-LOGGER	ABOUT 535	MAX REC. TEMP.			
BTM LOGGED INTERVAL	533	LOGGING SPEED	15 FEET/MIN.		
TOP LOGGED INTERVAL	0	INSTRUMENT MAKE	MOUNT SOPRIS		
OPERATING RIG TIME		INSTRUMENT MODEL	HLP2375/I		
RECORDED BY	JOB BUTTON	INSTRUMENT S/N	2397		
WITNESSED BY	SEAN OHARE				
BOREHOLE RECORD					
CASING AND SCREEN RECORD					
NO.	BIT	PROM	TO	SIZE	WGT.
1	14-INCH	0	60	16-INCH PVC	0
2	8-INCH	60	542		

Notes: 1. Gamma probe run inside Westbay MP38 multport well casing.  
 2. Down run started at 11:10, Up run started at 12:35. Power to probe was lost on first down run.  
 Run was restarted after a thunder storm passed.  
 3. Winch: Model 4MGB-1000, side by side, S/N 1303  
 4. Gamma probe sampling rate: 0.1 feet  
 5. The UP log was processed by first applying a moving average filter using WellCAD. A filter width of 20 was used. To reduce the number of data points by roughly 50% the filtered log was resampled using WellCAD using a sampling rate of 0.2 feet. The filtered and resampled log was used in gINT with the complete well construction and lithology log.  
 6. The well construction log only includes well screen and casing for clarity.  
 For backfill information see detailed well construction log.





**CDM**

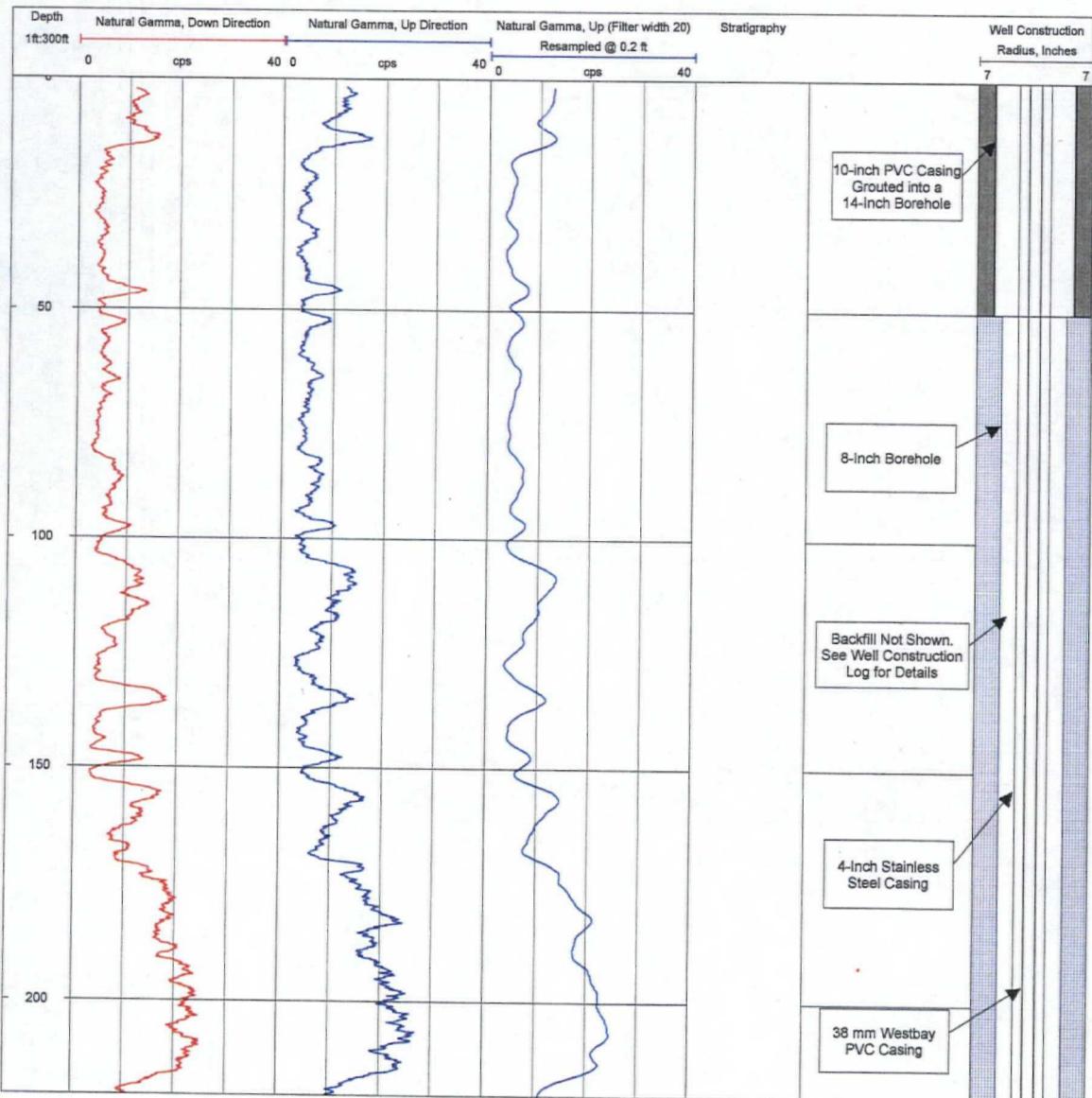
125 Maiden Lane, 5th Floor  
New York, NY 10038  
Phone: 212-785-9123  
Fax: 212-785-6114

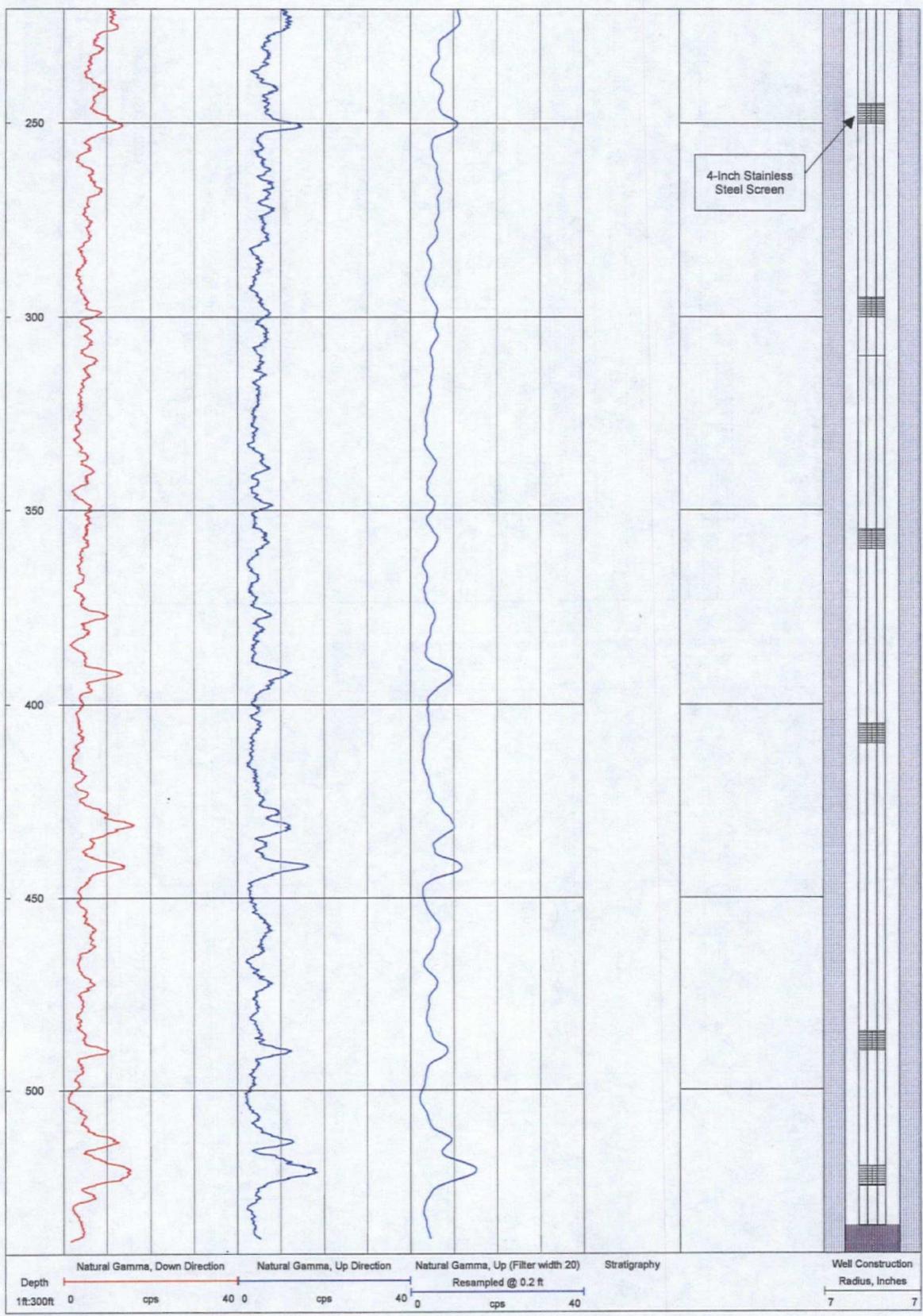


CO	WELL MW-SVP13	FLD	U.S. EPA, REGION II
CTY	ROOSEVELT FIELD	STTE	NEW YORK
FILING No			
NORTHING:			
COORDINATE SYSTEM AND DATUM: NYSP			
PERMANENT DATUM:	GROUND SURFACE	ELABORATION:	
LOG MEAS FROM:	0 FEET	ABOVE PERM. DATUM	
DRILLING MEAS FROM GROUND SURFACE			
DATE	7/12/2009	TYPE FLUID IN HOLE	WATER
RUN No	1 (DOWN AND 2 UP)	SALINITY	
TYPE LOG	NATURAL GAMMA	DENSITY	
DEPTH DRILLER	535	LEVEL	23 FEET BGS
DEPTH-LOGGER	515 TO 540	MAX REC. TEMP.	
BHM LOGGED INTERVAL	518	LOGGING SPEED	15 FEET/MIN.
TOP LOGGED INTERVAL	0	INSTRUMENT MAKE	MOUNT SORUS
OPERATING BIG TIME		INSTRUMENT MODEL	HIL2375I
RECORDED BY	JOB BUTTON	INSTRUMENT SN	2397
WITNESSED BY	SEAN O'HARE	K.B.	N/A
RUN	BORHOLE RECORD	CASING AND SCREEN RECORD	
NO.	BIT	FROM	TO
1	14-INCH	0	50
	8-INCH	50	542
		10-INCH PVC	
		0	50

Notes:

1. Gamma probe run inside Westbay MP38 multiport well casing.
2. Down run started at 09:15. Up run started at 10:05.
3. Winch Model 4KGB-1000, side by side, SN 1303.
4. Gamma probe sampling rate 0.1 feet
5. The UP log was processed by first applying a moving average filter using WellCAD. A filter width of 20 was used. To reduce the number of data points by roughly 50% this filtered log was resampled using WellCAD using a sampling rate of 0.2 feet. The filtered and resampled log was used in GRIT with the complete well construction and lithology log.
6. The well construction log only includes well screen and casing for clarity.
7. Bottom was difficult to feel with the gamma probe.







## Appendix D

**Appendix D**  
**Multi-port Well Development Sheets**

## DEVELOPMENT SUMMARY SHEET

DATE: 6/30/09

WELL #: SVP-12 (Part 1)

TIME: 12:25

DEPTH OF PUMP: 500'-525'

WEATHER CONDITIONS: Sunny ~75°F

CDM Personnel: Sean O'Hare

ELAPSE D TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVE D OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
12:28	→ Pugging Begins									Static DTW → 26.0°
12:40		30.3	20	6.80	0.223	212	13.68	17.21	49	
12:50		30.5	—	6.82	0.311	62.3	7.14	16.72	48	
12:52	→ Stop Pugging due to emptying water tank									
13:37	→ Start Pugging									Static DTW → 26.2°
13:45		30.6	20	6.76	0.216	39.4	7.69	16.04	51	
13:55		30.61	—	6.69	0.211	38.4	6.73	17.29	41	
14:05		30.61	—	6.79	0.207	22.4	6.52	16.89	49	
14:15		30.61	—	6.76	0.207	20.0	6.02	17.06	49	
14:25		30.5	—	6.75	0.207	16.1	5.98	17.24	51	
14:35		30.5	—	6.74	0.207	22.5	6.00	16.97	54	
14:40		30.4	—	6.77	0.207	15.2	6.05	16.97	48	
14:42		30.4	—	6.76	0.207	15.5	6.01	16.80	49	
14:45		30.4	—	6.75	0.207	15.1	5.98	16.91	48	
14:47		30.4	—	6.75	0.207	15.4	5.98	16.99	49	
14:48	→ Stop Pugging / Parameters Stabilized									Total → 1,980 gallons purged

## DEVELOPMENT SUMMARY SHEET

DATE: 6/30/99

WELL #: SV-12

TIME: 09:45

DEPTH OF PUMP: 485'-490' (Part 2)

WEATHER CONDITIONS: Sunny, Few Clouds ~70°F CDM Personnel: Sean O'Hare

ELAPSE D TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVE D OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
09:50	→ Started Purge									Static DTW → 25.65'
10:00		30.61	20	6.91	0.236	531	7.81	17.04	41	
10:19		-	-	6.94	0.222	134	7.17	16.55	43	
10:20		31.0	20	6.91	0.220	83.9	6.76	16.40	44	
10:30		31.0		6.88	0.219	58.0	6.59	16.68	46	
10:31	→ Stop Purge to empty water tank									
11:15	→ Resume Purging									
11:25		31.1	18	6.84	0.231	54.9	6.33	17.83	46	
11:35		31.1	18	6.85	0.216	43.0	6.29	17.06	42	
11:45		31.2	18	6.83	0.215	34.9	6.21	16.87	46	
11:55		31.2	18	6.82	0.214	36.8	6.40	16.75	46	
12:00		31.1		6.81	0.214	29.3	6.15	16.52	47	
12:05		30.7		6.80	0.215	30.7	6.18	16.49	46	

## **DEVELOPMENT SUMMARY SHEET**

DATE: 6/30/09

WELL #: SVP-12

TIME: 10:08

**DEPTH OF PUMP:** 485' - 490' (Part 2)

**WEATHER CONDITIONS:** Sunny ~ 70°F

**CDM Personnel:** Sean O'Hare

## DEVELOPMENT SUMMARY SHEET

DATE: 6/30/09

WELL #: SUP-12 (Port 3)

TIME: 06:50

DEPTH OF PUMP: 405' - 410'

WEATHER CONDITIONS: Sunny, Few Clouds ~70°F CDM Personnel: Sean O'Hare

ELAPSED TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVED OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mV)	OBSERVATIONS
06:52	→ Started Pumping									Static DTW → 26.5°
07:05		31.4	18	5.45	0.252	242	6.35	17.35	165	
07:15		—	—	6.40	0.215	75.1	6.32	16.57	76	
07:26		—	—	6.63	0.218	40.7	6.45	16.35	63	
07:35		—	—	6.71	0.219	35.9	6.17	16.33	60	
07:45		—	—	6.76	0.220	29.9	6.05	16.36	55	
07:46	→ Stop Pumping / Uni-tech needs to empty water tank									
08:30	→ Start Pumping									
08:40		30.85'	20	6.86	0.219	44.8	6.93	16.71	47	
08:50		—	—	6.87	0.217	38.7	6.02	16.42	42	
09:00		—	—	6.90	0.215	23.9	6.68	16.21	43	
09:05				6.88	0.215	23.4	6.67	16.36	44	
09:10				6.87	0.215	23.1	6.66	16.23	41	

## DEVELOPMENT SUMMARY SHEET

DATE: 6/30/09

WELL #: SV-12 (Part 3)

TIME: 09:19

**DEPTH OF PUMP:** 405' - 410'

**WEATHER CONDITIONS:** Sunny, Few Clouds ~70°F

**CDM Personnel:** Sean O'Hare

## DEVELOPMENT SUMMARY SHEET

DATE: 6/29/09

WELL #: SUP-12 (Part 4)

TIME: 15:00

DEPTH OF PUMP: 355' - 360'

WEATHER CONDITIONS: Sunny, Blue Skies ~ 75°F

CDM Personnel: Sean O'Hare

ELAPSED TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVED OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
14:55	→ Uni-Tech begins pumping									Static → 25.65' DTW
15:00		25.75'	20	7.23	0.205	241	5.81	18.74	75	
15:10		-	-	7.26	0.210	109.6	5.81	17.49	75	
15:20		-	-	7.23	0.211	131	5.81	17.50	71	
15:30		-	-	7.21	0.207	67.2	5.93	17.19	71	
15:40		-	-	7.16	0.204	52.6	5.90	17.11	67	
15:50		-	-	7.17	0.202	47.3	5.98	16.96	72	
	→ Stop Purging. Water Tank needs to be emptied									
16:30	→ Purge Starts Again									
16:40		-	-	7.08	0.181	36.9	5.91	18.59	74	
16:50		25.65'		7.03	0.196	52.1	6.91	17.42	67	
17:00		-	-	7.04	0.196	52.7	6.81	16.92	69	
17:05		-	-	7.02	0.195	48.5	6.42	16.62	67	

## **DEVELOPMENT SUMMARY SHEET**

DATE: 6/29/09

WELL #: SUP-12 (Part 4)

TIME: 17:00

**DEPTH OF PUMP:** 355'-360'

**WEATHER CONDITIONS:** Sunny, Blue Skies ~75°F

**CDM Personnel:** Sean O'Hare

1-1 of 2

## DEVELOPMENT SUMMARY SHEET

DATE: 6/29/09

WELL #: SVP-12 (Part 5)

TIME: 12:00

DEPTH OF PUMP: 295'-300'

WEATHER CONDITIONS: Sunny, Blue Skies ~ 80°F CDM Personnel: Sean O'Hare

ELAPSED TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVED OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
12:00	→ Start Purging									03.6' → static water level Dept
12:10		31.9	20	7.37	0.243	118	6.97	17.73	93	
12:20		31.9	-	7.38	0.240	56.6	6.43	16.42	76	
12:30		31.9	-	7.34	0.242	56.5	6.28	16.70	65	
12:40		31.9	-	7.30	0.243	99.6	6.16	16.94	72	
12:50		32.0'	-	7.29	0.242	81.0	6.50	16.83	73	
13:00		32.1'	-	7.26	0.239	61.7	6.20	17.01	69	
13:10		32.1'	-	7.24	0.237	51.4	6.08	16.91	66	
13:20		32.1'		7.22	0.235	52.7	6.02	16.85	66	
13:25	→ Stop Purging to empty tank									
14:05	→ Start Purging Again									
14:15		31.7'	20	7.24	0.224	26.0	7.08	18.23	80	
14:25		31.7	20	7.18	0.224	23.5	6.45	17.55	59	

45  
 x 20  
 —  
 900

## DEVELOPMENT SUMMARY SHEET

DATE: 6/29/09

WELL #: SUP-12 (Part 8)

TIME: 14:25

DEPTH OF PUMP: 295 - 300

**WEATHER CONDITIONS:** Sunny, Blue Skies ~75°F

**CDM Personnel:** Sean O'Hare

## DEVELOPMENT SUMMARY SHEET

DATE: 6/29/09

WELL #: SUP-12 (Part 6)

TIME: 09:55

DEPTH OF PUMP: 245'-250'

WEATHER CONDITIONS: Sunny, Blue Skies ~

CDM Personnel: Sean O'Hare

ELAPSE D TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVED OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mV)	OBSERVATIONS
09:55	→ Begin Pugging									static DTW is 26.35'
10:00	31.8	27.5	6.22	0.392	940	19.60	18.50	██████████		
10:10	31.95	-	6.76	0.366	156	7.05	17.12	145		
10:29	32.0	-	7.00	0.261	59.7	6.58	16.79	120		
10:30	32.05	-	7.12	0.256	37.5	5.97	16.73	108		
10:40	32.0	-	7.11	0.253	44.6	6.39	16.51	99		
10:50	32.0	-	7.10	0.251	64.3	6.39	16.51	97		
10:55	32.0	-	7.10	0.250	60.9	6.32	16.23	92		
11:00	31.75	-	7.11	0.249	57.3	6.34	16.26	90		
11:05	31.5	-	7.11	0.248	50.9	6.27	16.27	89		
11:10	31.5	-	7.11	0.256	51.2	6.22	16.14	87		
11:15	31.5	-	7.12	0.256	50.9	6.19	16.24	86		
11:20	31.5	-	7.12	0.255	50.9	6.17	16.21	87	Turbidity will not go under 50 NTU	

\* A total of 1700 gallons  
was purged from Port 6 at SUP-12

## DEVELOPMENT SUMMARY SHEET

DATE: 6/24/09

WELL #: SUP-13 (~~2107~~) (Part 1)

TIME: 12:10

DEPTH OF PUMP: 500 - 525

WEATHER CONDITIONS: Cloudy, Overcast - 60°F CDM Personnel: Sean O'Hare

ELAPSE D TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVE D OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
12:05	24.45									static DTW is 24.45'
12:10 → Start Pumping										
12:20	28.45	27	6.36	0.209	240	6.75	17.51	74	Purge DTW is 28.45'	
12:30	-	-	6.33	0.214	174	6.49	16.40	80		
12:40	-	-	6.30	0.213	134	6.32	16.12	87		
12:50	-	-	6.27	0.211	33.9	6.15	15.85	88		
12:55	-	-	6.27	0.211	16.1	6.32	15.64	88		
13:00	-	24	6.26	0.209	12.5	6.34	15.62	90		
13:05	-	-	6.26	0.209	10.31	6.35	15.61	90		
13:10	-	-	6.26	0.209	10.15	6.34	15.62	90		
13:15	-	-	6.26	0.207	8.62	6.28	15.68	92		
13:20	-	-	6.26	0.206	7.60	6.22	15.57	92		
13:25	-	-	6.26	0.206	7.65	6.29	15.55	93		
13:30	-	-	6.26	0.206	7.62	6.23	15.57	93	A total of 1700 gallons purged	

\*Note: Turbidity would not go below 7.62

**DEVELOPMENT SUMMARY SHEET**

DATE: 6/24/09

WELL #: SVP-13

TIME: 07:05

DEPTH OF PUMP: 485'-490' (Part 2)

WEATHER CONDITIONS: Overcast, Light rain - 60°F CDM Personnel: Sean O'Hare

ELAPSE D TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVED OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
07:30		24.25'								Initial DTW is 24.25'
07:45 200	28.35'	15	5.55	0.247	147	7.79	17.42	129	Purge 200 DTW is 28.35'	
→ Stop Purging → Uni-Tech needed to move water tank to SVP-12 and remove spill										
09:30 → Stop Purging		DTW - 28.5'								
09:45	28.5'	26	6.10	0.220	29.3	7.61	17.35	99		
09:55		26	6.19	0.220	47.5*	6.30	16.49	90		
10:05		26	6.21	0.220	27.2*	6.50	16.01	88		
10:15		26	6.19	0.220	10.95	10.51	15.85	90		
10:25		26	6.20	0.220	9.26	6.73	15.63	89		
10:35		-	6.21	0.220	6.82	6.52	15.55	89		
10:40		-	6.20	0.219	6.13	6.28	15.62	92		
10:45		-	6.20	0.218	6.27	6.11	15.53	93		
10:45		-	6.21	0.218	6.25	6.19	15.47	90	A total of 1900 gallons purged.	

Note: Turbidity did not get better

## **DEVELOPMENT SUMMARY SHEET**

DATE: 6/23/09

**WELL #:** SVP-13 (Part #3)

TIME: 15:49

**DEPTH OF PUMP:** 405' - 410'

**WEATHER CONDITIONS:** Partly Cloudy ~ 65°F    **CDM Personnel:** Sean O'Hare

## DEVELOPMENT SUMMARY SHEET

DATE: 6/23/09

WELL #: SVP-13 (Port #4)

TIME: 12:20

DEPTH OF PUMP: 355' - 360'

WEATHER CONDITIONS: Partly Cloudy ~65°F CDM Personnel: Sean O'Hare

ELAPSE D TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVE D OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
										Initial DTW before Purging is ~23.3'
12:30	29.2	21	6.56	.204	75.7	10.12	16.79	76		
12:40	-	-	6.55	.202	113	6.96	16.43	93		
12:50	-	-	6.50	.197	120	6.66	16.45	97		
13:00	-	-	6.49	.201	634	9.96	16.04	98		
13:10	-	-	6.49	.200	32.0	6.55	16.07	99		
13:20	-	-	6.51	.199	24.0	6.37	15.92	96		
13:30	-	-	6.50	.198	18.8	6.36	15.93	95		
13:35	-	-	6.50	.198	17.4	6.63	15.72	95		
13:40	→ Water tank is filled and needs to be emptied									
14:20	→ Purging starts again									
14:30	28.85	21	6.47	.196	24.2	6.14	17.33	91		
14:40	-	-	6.40	.195	32.4	6.08	16.43	101		

## **DEVELOPMENT SUMMARY SHEET**

**DATE:** 6/23/09

**WELL #:** SUP-13 (Part #4)

TIME: 14:45

**DEPTH OF PUMP:** 355' - 360'

**WEATHER CONDITIONS:** Partly Cloudy ~65°F **CDM Personnel:** Sean O'Hare

## DEVELOPMENT SUMMARY SHEET

DATE: 6/23/09

WELL #: SVP-13 (Pvt #5)

TIME: 08:00

DEPTH OF PUMP: 295' - 300'

WEATHER CONDITIONS: Partly Cloudy ~68°F CDM Personnel: Sean O'Hare

ELAPSE D TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVE D OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
										Initial DTW is 23.3'
08:05		28.2'	30	4.96	0.258	37.0	8.11	17.29	274	
08:35	-	-	-	5.81	0.218	159.0	6.96	16.41	177	
08:45	-	-	-	6.04	0.218	46.1	6.70	15.98	132	
08:55	-	-	-	6.10	0.219	26.6	6.45	15.88	126	
09:05	-	-	-	6.15	0.218	17.9	6.42	15.69	121	
09:15	-	-	-	6.19	0.219	14.8	6.64	15.66	116	
09:20	-	-	-	6.21	0.218	13.6	6.44	15.59	114	
09:25	-	-	-	6.21	0.217	14.1	6.51	15.54	117	
09:30	-	-	-	6.23	0.217	12.4	6.59	15.67	108	
09:35	→	Water Tank needs to be emptied.								
10:20	→	Pumping starts again								
10:25	-	-	-	6.35	0.208	27.4	9.31	17.07	94	

## DEVELOPMENT SUMMARY SHEET

DATE: 6/23/09

TIME: 10:30

WEATHER CONDITIONS: Partly Cloudy

WELL #: SVP-13 (Part #5)

DEPTH OF PUMP: 275' - 300'

CDM Personnel: Sem O'Hare

ELAPSE D TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVE D OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
10:35		28.2'	30	6.41	0.209	148	7.17	16.46	97	
10:45		-	-	6.44	0.213	31.8	6.99	15.97	103	
10:55		-	-	6.41	0.211	31.6	8.79	15.87	109	
11:05		-	-	6.44	0.209	16.1	6.60	15.80	107	
11:10		-	-	6.43	0.208	15.0	6.43	15.81	107	
11:15		-	-	6.46	0.207	15.1	6.62	15.76	106	
11:20		-	-	6.44	0.206	12.5	6.53	15.73	104	
11:25		-	-	6.44	0.207	12.3	6.55	15.72	105	
11:30		-	-	6.45	0.204	12.2	6.56	15.85	106	
11:35		-	-	6.45	0.204	12.3	6.60	15.86	107	
11:40	→ Stop Purging / Parameters Stabilized / Well Developed									
	✗ Turbidity could not reach below 12.3								✗ A total of	
									3400 gallons	Purged

## DEVELOPMENT SUMMARY SHEET

DATE: 6/22/09

WELL #: SVP-13 (Part #6)

TIME: 14:00

DEPTH OF PUMP: 245' - 250'

WEATHER CONDITIONS: Overcast, humid ~65°F CDM Personnel: Sean O'Hare

ELAPSED TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm)	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVED OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
Before Purge	24.25									
14:05	32.25	35	5.39	0.328	1,713	12.57	18.59	208		
14:30	32.25	-	6.10	0.232	277	11.18	17.06	155		
14:35	32.07	-	6.29	0.224	89.3	10.90	16.39	129		
14:50	32.07	-	6.37	0.220	61.2	10.70	16.23	125		
15:00	32.07	-	6.34	0.219	35.8	10.27	16.07	128		
15:05	Purging stops	since water tank is filled and needs to be emptied								
15:45	Purging starts again						3			
15:50	32.07	35	6.55	0.213	57.9	13.09	16.76	117		
16:00	32.07	-	6.65	0.216	187	11.97	16.65	111		
16:10	→ Shut down temporarily to lower rate									
16:25	31.07	23	6.60	0.217	00.08	11.07	16.23	113		
16:30	31.07	23	6.53	0.212	77.2	10.70	15.83	113		

## **DEVELOPMENT SUMMARY SHEET**

DATE: 6/22/09

WELL #: SVP-13 (Part #6)

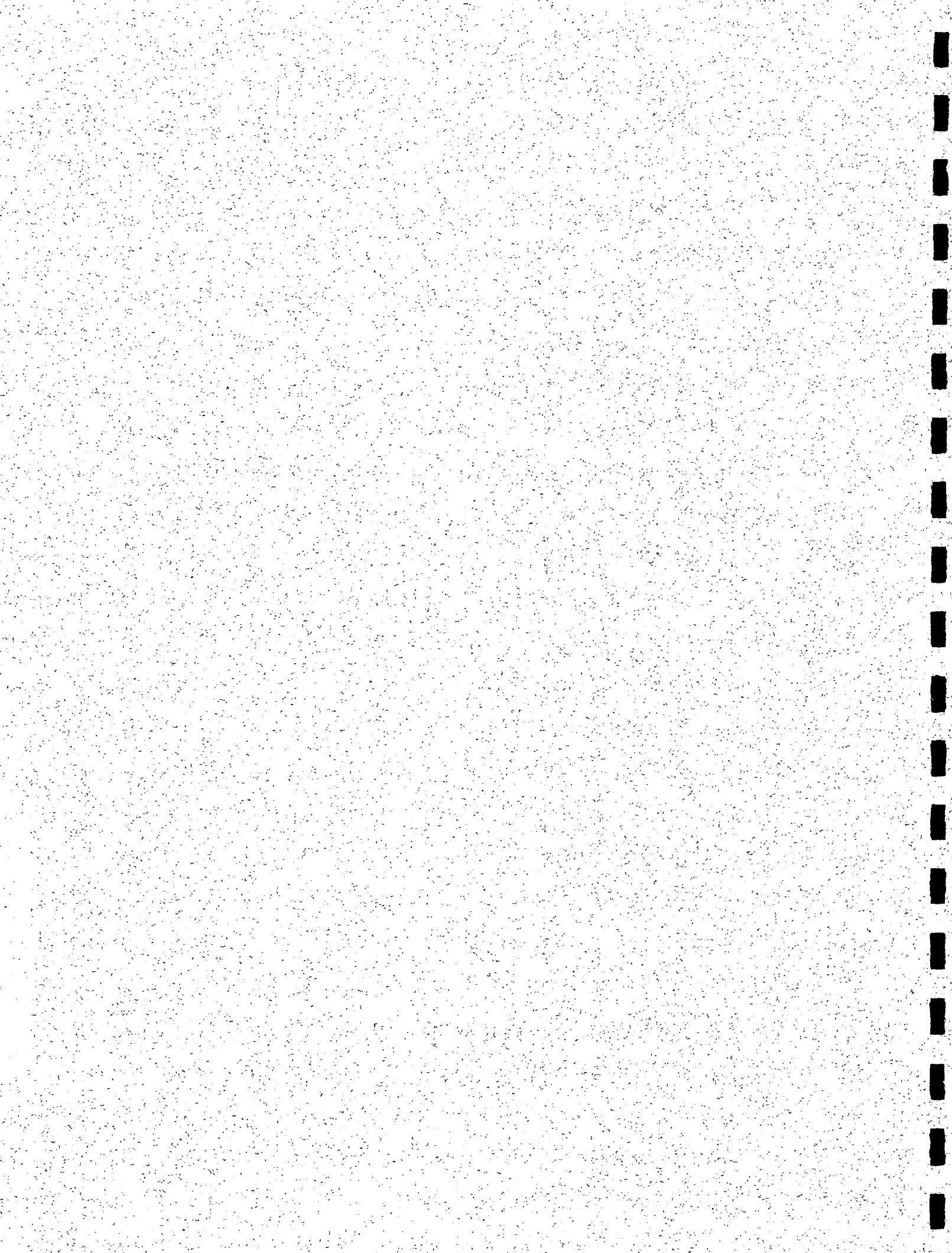
**TIME:** 16:35

**DEPTH OF PUMP:** 245'-250'

**WEATHER CONDITIONS:** Overcast, humid ~65°F

**CDM Personnel:** Sean O'Hare

# Appendix E

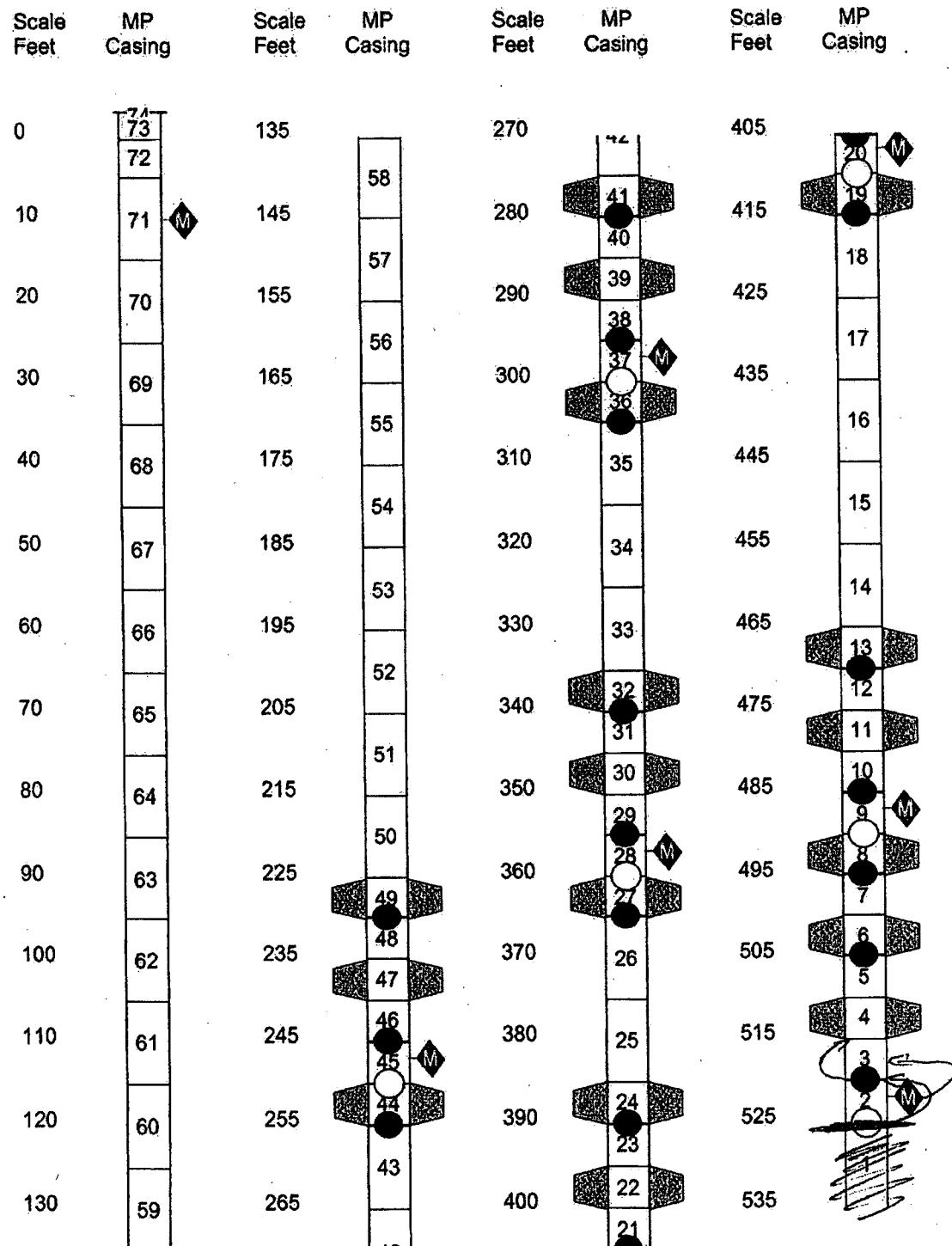


**Appendix E**

**Westbay Well Installation Field Sheets**

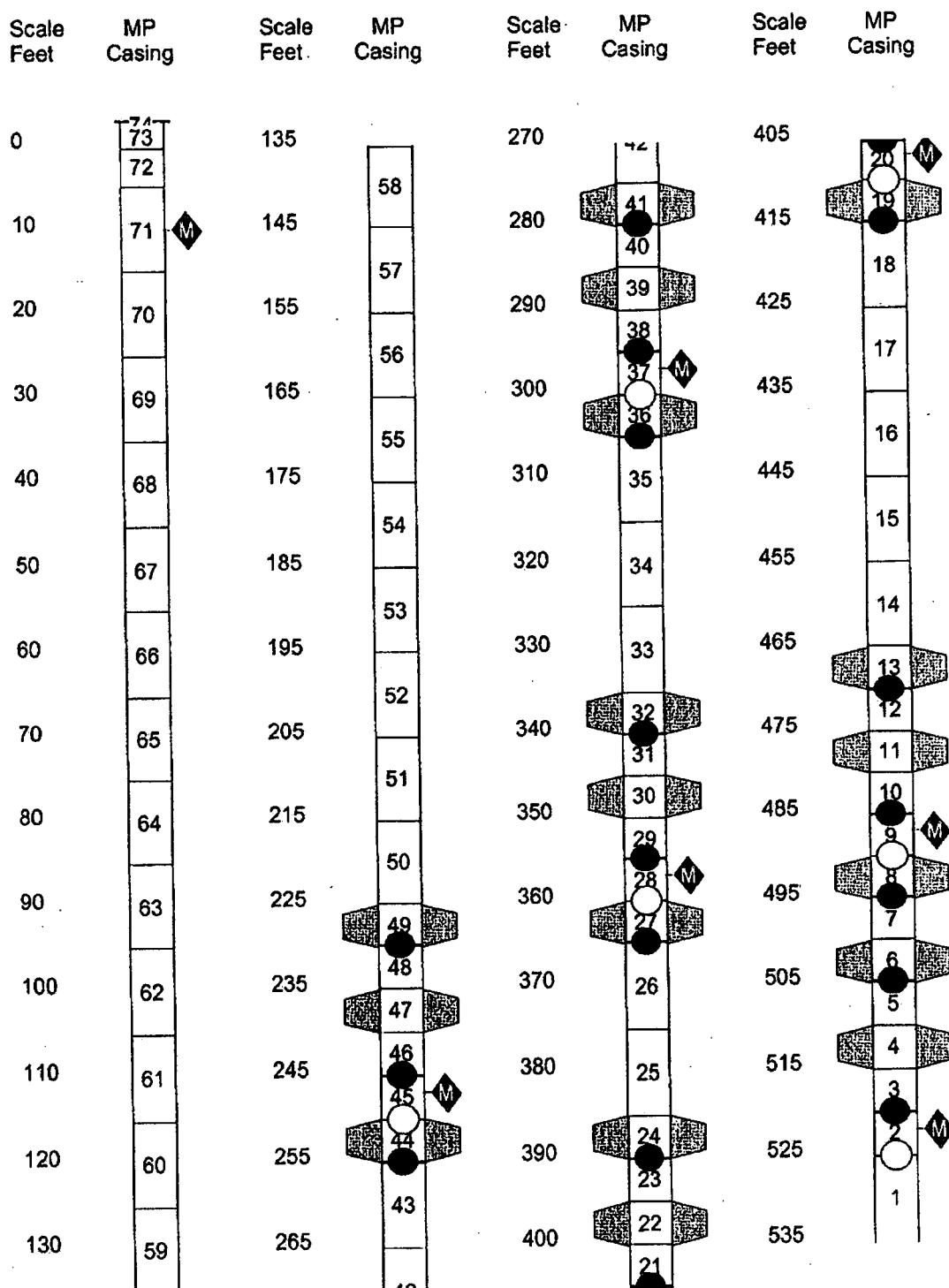
Summary Casing Log  
CDM/Uni-Tech Drilling

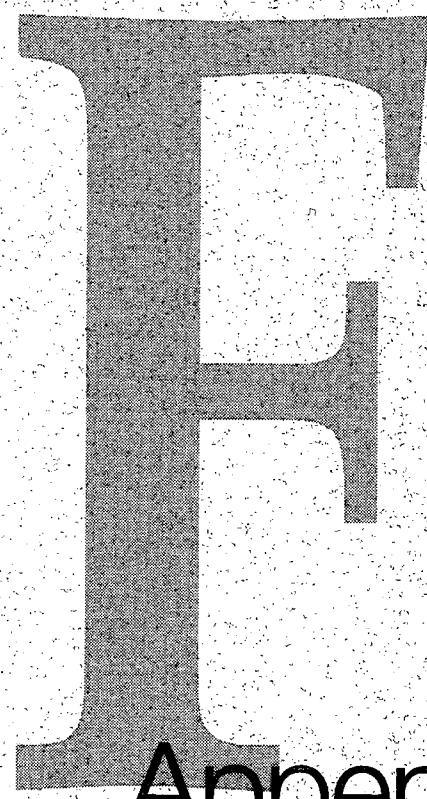
Job No: WB845  
Well: SVP-12



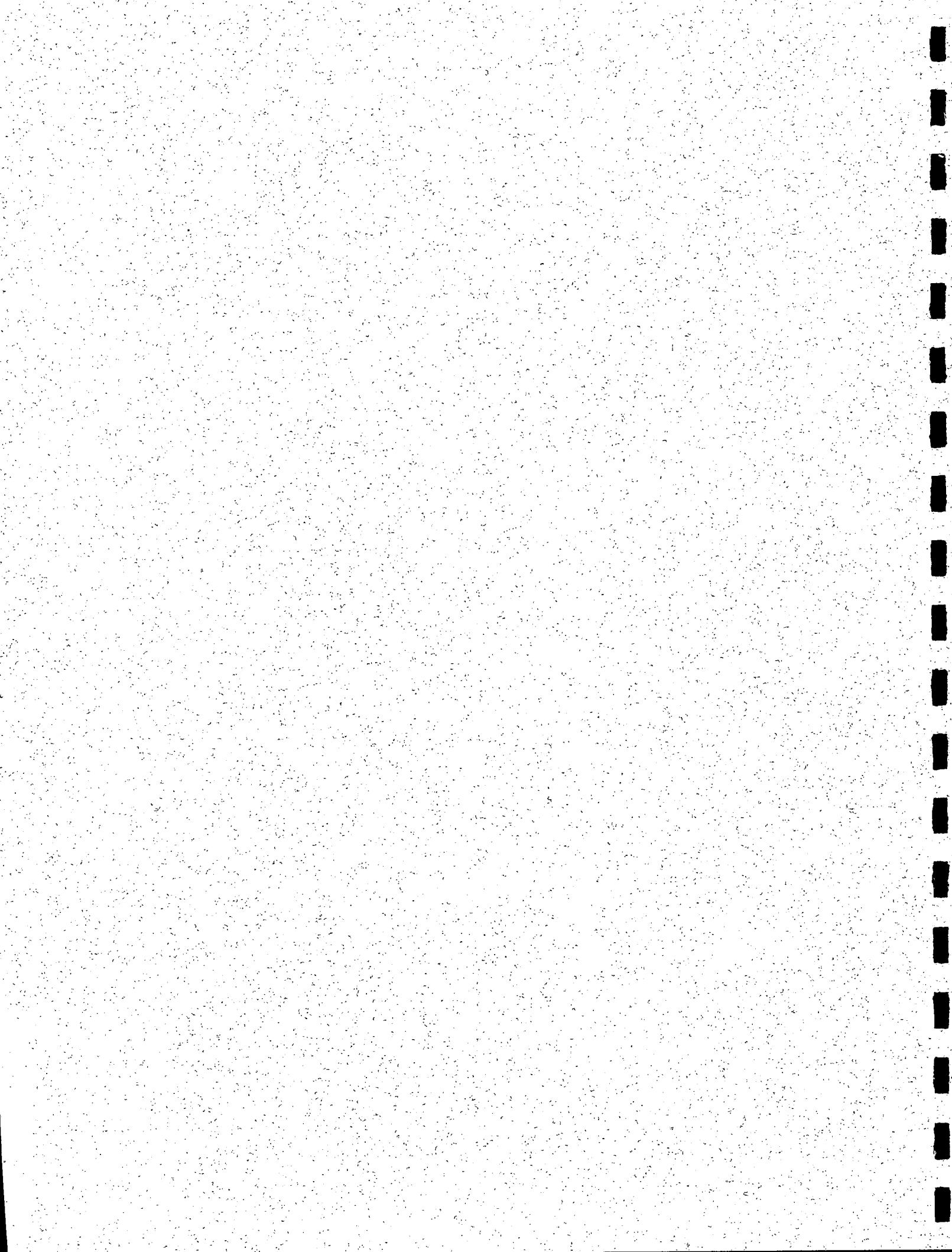
Summary Casing Log  
CDM/Uni-Tech Drilling

Job No: WB845  
Well: SVP-13





## Appendix F



**Appendix F**  
**Multi-port Well Sampling Sheets**

# **Groundwater Sampling**

## **Field Data Sheet**

Project: Roosevelt  
Monitoring Well No.: Sip-1  
Sampling Zone No(s).: 1-16

Date: July 22, 2009  
Start Time: 12001 Atm. Rdg: 14.66  
End Time: 1435 Atm. Rdg: 14.66  
Operators: MJEP TGE

**Additional Comments:** (pH, turbidity, S.C., etc.)

Additional Comments: (pH, turbidity, S.C., etc.)

$\frac{1}{450}$   $\frac{2}{403}$   $\frac{3}{373}$   $\frac{4}{318}$   $\frac{5}{293}$   $\frac{6}{253}$   $\frac{7}{203}$   $\frac{8}{153}$   $\frac{9}{103}$   $\frac{10}{53}$

DTW: A) Well \_\_\_\_\_ B) Answer \_\_\_\_\_

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

## **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

**mS/cmc - milli-Siemens per centimeter**

NTU - nephrolometric turbidity unit

# **Groundwater Sampling**

## **Field Data Sheet**

Project: ROOSEVELT  
Monitoring Well No.: SIP-2  
Sampling Zone No(s).: 1-10

Date: July 22, 2009  
Start Time: 9:05 Atm. Rdg: 4463  
End Time: 11:30 Atm. Rdg: 4463  
Operators: MTE & TEE

Additional Comments: (pH, turbidity, S.C., etc.)

ditional Comments: (pH, turbidity, S.C., etc.)

1	2	3	4	5	6	7	8	9	10
450	413	373	333	293	253	193	153	103	53

BTW: A) well \_\_\_\_\_ B) otherwise \_\_\_\_\_

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

## **Acronyms:**

•C - degrees Celsius

mg/L - milligrams per Liter

**mS/cm<sup>-1</sup> - milli-Siemens per centimeter**

#### **NTU - nephrolometric turbidity unit**

# **Groundwater Sampling**

## **Field Data Sheet**

Project: ROOSEVELT  
Monitoring Well No.: SVP-3  
Sampling Zone No(s.): 1-7

Date: JULY 23, 2009  
Start Time: 10:39 Atm. Rdg: 14.56  
End Time: 12:15 Atm. Rdg: 14.55  
Operators: MTH & TEE

**Additional Comments: (pH, turbidity, S.C., etc.)**

DW: A) Well \_\_\_\_\_ B) otherwise \_\_\_\_\_

Additional Comments: (pH, turbidity, S.C., etc.)

1 2 3 4 5 6 7  
450 393 373 293 173 103 53

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

## **Acronyms:**

°C - degrees Celsius

**mg/L - milligrams per Liter**

**mS/cm<sup>c</sup>** - milli-Siemens per centimeter

## **NTU - nephrolometric turbidity unit**

# **Groundwater Sampling**

## **Field Data Sheet**

Project: ROOSEVELT  
Monitoring Well No.: S-104  
Sampling Zone No(s).: 1-10

Date: July 23, 2009  
Start Time: 7:58 Atm. Rdg: 14.56  
End Time: 19:20 Atm. Rdg: 14.62  
Operators: MTE & JTG

**Additional Comments:** (pH, turbidity, S.C., etc.)

$$\frac{1}{420} \quad \frac{2}{400} \quad \frac{3}{353} \quad \frac{4}{308} \quad \frac{5}{288} \quad \frac{6}{248} \quad \frac{7}{180} \quad \frac{8}{148} \quad \frac{9}{103} \quad \frac{10}{48}$$

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

## **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

**mS/cm<sup>c</sup>** - milli-Siemens per centimeter

NTU - nephrolometric turbidity unit

# Groundwater Sampling

## Field Data Sheet

Project: Roosevelt  
 Monitoring Well No.: SVP-5  
 Sampling Zone No(s.): 1-10

Date: 7/24/05  
 Start Time: 8:45 Atm. Rdg: 14.46  
 End Time: 12:30 Atm. Rdg:  
 Operators: J Lee + M. Koberle

Port No.	Run No. 4024 OUT	Surface Function Tests (probe in flushing collar)						Position Sampler		Sample Collection Checks (probe located at sampling zone in Westbay casing)						Comments (volume recovered)	P H T W E L O N I D		
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Apply Vacuum	Close Valve			Pressure in Westbay ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in Westbay ( )		
1	1	✓	✓	✓	✓	✓	✓	✓	✓	187.84	✓	187.69	✓	187.70	✓	✓	187.84	900	
3	1	✓	—	✓	✓	✓	✓	✓	✓	186.51	✓	156.46	✓	156.46	✓	✓	156.51	915	
5	1	✓	—	✓	✓	✓	✓	✓	✓	126.27	✓	128.53	✓	128.53	✓	✓	126.27	930	
6	1	✓	—	—	—	—	—	—	—	110.82	✓	111.41	✓	111.41	✓	✓	110.82	945	
8	1	✓	—	✓	✓	✓	✓	✓	✓	67.29	✓	68.88	✓	68.88	✓	✓	67.29	1000	
9	1	✓	✓	✓	✓	✓	✓	✓	✓	43.31	✓	45.30	✓	45.30	✓	✓	43.34	1015	
10	1	✓	—	✓	✓	✓	✓	✓	✓	21.54	✓	23.67	✓	23.67	✓	✓	21.54	1030	
2	1	✓	✓	✓	✓	✓	✓	✓	✓	178.60	✓	178.17	✓	178.17	✓	✓	178.60	1045	
2	2	✓	✓	—	—	—	—	—	—	178.50	✓	178.17	✓	178.17	✓	✓	178.50		
4	1	✓	✓	✓	✓	✓	✓	✓	✓	137.25	✓	137.10	✓	137.10	✓	✓	137.25	1115	
4	2	✓	✓	✓	✓	—	—	—	—	137.25	✓	137.10	✓	137.10	✓	✓	137.25		
7	1	✓	✓	✓	✓	✓	✓	✓	✓	84.97	✓	86.01	✓	86.01	✓	✓	84.97	1145	
7	2	✓	✓	✓	✓	✓	✓	✓	✓	84.97	✓	86.01	✓	86.01	✓	✓	84.97		

Additional Comments: (pH, turbidity, S.C., etc.)

1 430 2 408 3 358 4 313 5 293 6 253 7 193 8 153 9 98 10 48

DNW: A) WELL — B) AWKWARD —

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

## **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

mS/cm<sup>-1</sup> - milli-Siemens per centimeter

### **NTU - nephrolometric turbidity unit**

# **Groundwater Sampling**

## **Field Data Sheet**

Project: Roosevelt  
Monitoring Well No.: SWP-6  
Sampling Zone No(s.): 1-6

Date: July 23, 2009  
Start Time: 1258 Atm. Rdg: 14.56  
End Time: 1420 Atm. Rdg: 14.58  
Operators: MTE & JLE

**Additional Comments:** (pH, turbidity, S.C., etc.)

$$\frac{1}{447} \quad \frac{2}{370} \quad \frac{3}{250} \quad \frac{4}{180} \quad \frac{5}{105} \quad \frac{6}{50}$$

FB @ 13<sup>30</sup> SW: A) well \_\_\_\_\_ B) aware \_\_\_\_\_

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

## **Acronyms:**

°C - degrees Celsius

**mg/L - milligrams per Liter**

mS/cm<sup>-1</sup> - milli-Siemens per centimeter

NTU - nephrolometric turbidity unit

# **Groundwater Sampling**

## **Field Data Sheet**

Project: Roosevelt  
Well No.: SIP-7  
Line No(s.): 1-6

Date: AUGUST 4, 2009  
Start Time: 12:52 Atm. Rdg: 14.52  
End Time: 14:20 Atm. Rdg: 14.53  
Operators: MJF & JLEK

**Additional Comments: (pH, turbidity, S.C., etc.)**

DW: A) Well \_\_\_\_\_ B) Likewise \_\_\_\_\_

$$\frac{1}{445} \quad \frac{2}{428} \quad \frac{3}{315} \quad \frac{4}{208} \quad \frac{5}{103} \quad \frac{6}{48}$$

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

## **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

mS/cm<sup>-1</sup> - milli-Siemens per centimeter

NTU - nephrolometric turbidity unit

④ NOTE: USING PH PAPER DUE TO PH SENSOR  
INACCURACY

# **Groundwater Sampling**

## **Field Data Sheet**

Project: **Roosevelt**  
Monitoring Well No.: **SW-3**  
Sampling Zone No(s): **1-6**

Date: JULY 31, 2009  
Start Time: 7:35 Atm. Rdg: 14.48  
End Time: 950 Atm. Rdg: 14.55  
Operators: MJE & JLEF

Additional Comments: (pH, turbidity, S.C., etc.)

DW: A) well \_\_\_\_\_ B) aware \_\_\_\_\_

Additional Comments: (pri., turbidity, S.C., etc.)

1	2	3	4	5	6
435	373	238	158	103	48

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

## **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

mS/cm<sup>c</sup> - milli-Siemens per centimetre

NTU - nephrolometric turbidity unit

# Groundwater Sampling

## Field Data Sheet

Project: ROOSEVELT  
 Monitoring Well No.: SIP-9  
 Sampling Zone No(s.): 1-10

Date: JULY 27, 2009  
 Start Time: 02:41 Atm. Rdg: 14.51  
 End Time: 12:25 Atm. Rdg: 14.52  
 Operators: MJE & JLEF

Pond No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler		Sample Collection Checks (probe located at sampling zone in Westbay casing)								Comments (volume recovered)	
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Apply Vacuum	Close Valve	Locate Port	Arm Out	Land Probe	Pressure in Westbay ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in Westbay ( )	
8	1	✓	✓	✓	✓	✓	✓	147	✓	✓	65.08	✓	64.77	✓	64.73	✓	✓	65.09	
8	2	✓	✓	✓	✓	✓	✓	147	✓	✓	65.07	✓	64.74	✓	64.71	✓	✓	65.06	
8	3	✓	✓	✓	✓	✓	✓	147	✓	✓	65.07	✓	64.74	✓	64.72	✓	✓	65.07	
7	1	✓	✓	✓	✓	✓	✓	402	✓	✓	176.12	✓	174.74	✓	174.76	✓	✓	176.10	
7	2	✓	✓	✓	✓	✓	✓	402	✓	✓	176.11	✓	174.76	✓	174.74	✓	✓	176.11	
5	1	✓	✓	✓	✓	✓	✓	247	✓	✓	126.03	✓	125.10	✓	125.10	✓	✓	126.03	
5	2	✓	✓	✓	✓	✓	✓	247	✓	✓	126.03	✓	125.10	✓	125.10	✓	✓	126.04	
1	1	✓	✓	✓	✓	✓	✓	402	✓	✓	210.30	✓	209.30	✓	209.39	✓	✓	210.32	
3	1	✓	✓	✓	✓	✓	✓	352	✓	✓	153.26	✓	153.24	✓	153.22	✓	✓	153.27	
4	1	✓	✓	✓	✓	✓	✓	307	✓	✓	134.15	✓	133.77	✓	133.77	✓	✓	134.15	
6	1	✓	✓	✓	✓	✓	✓	247	✓	✓	108.01	✓	107.83	✓	107.61	✓	✓	108.02	
7	1	✓	✓	✓	✓	✓	✓	187	✓	✓	81.85	✓	81.93	✓	81.90	✓	✓	81.86	
9	1	✓	✓	✓	✓	✓	✓	102	✓	✓	44.79	✓	45.40	✓	45.34	✓	✓	44.78	
10	1	✓	✓	✓	✓	✓	✓	47	✓	✓	30.77	✓	31.59	✓	31.59	✓	✓	30.79	

Additional Comments: (pH, turbidity, S.C., etc.)

1 482 2 402 3 352 4 307 5 207 6 247 7 187 8 102 9 47

DW: A) WELL \_\_\_\_\_ B) Adverse \_\_\_\_\_

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

## **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

**mS/cm<sup>c</sup>** - milli-Siemens per centimeter

## **NTU - nephrolometric turbidity unit**

# Groundwater Sampling

## Field Data Sheet

Project: ROOSEVELT  
 Monitoring Well No.: SIP-10  
 Sampling Zone No(s.): 1-10

Date: AUGUST 3 2009  
 Start Time: 8:45 Atm. Rdg: 14.56 8/3  
 End Time: 12:20 Atm. Rdg: 14.53 8/4  
 Operators: MDE & JLEK

Part No.	Run No.	Arm Out	Surface Function Tests (probe in flushing collar)						Position Sampler						Sample Collection Checks (probe located at sampling zone in Westbay casing)						Comments (volume recovered)	Time
			Shoe Out	Close Valve	Check Vacuum	Open Valve	Apply Vacuum	Close Valve	Locate Port	Arm Out	Land Probe	Pressure in Westbay ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in Westbay ( )	Probe Off		
1	1	/	✓	✓	✓	✓	✓	✓	482	✓	✓	211.23	✓	209.12	✓	✓	✓	✓	211.26	400	IL	
2	1	✓	✓	✓	✓	✓	✓	✓	402	✓	✓	176.90	✓	174.34	✓	✓	✓	✓	176.92	1000	8/3	
2	2	✓	✓	✓	✓	✓	✓	✓	402	✓	✓	176.91	✓	174.34	✓	✓	✓	✓	176.81	—	8/3	
3	1	✓	✓	✓	✓	✓	✓	✓	352	✓	✓	154.64	✓	152.87	✓	✓	✓	✓	154.63	1000	8/3	
4	1	✓	✓	✓	✓	✓	✓	✓	307	✓	✓	135.49	✓	133.41	✓	✓	✓	✓	135.49	1000	8/3	
4	2	✓	✓	✓	✓	✓	✓	✓	307	✓	✓	135.49	✓	133.42	✓	✓	✓	✓	135.46	—	8/3	
5	1	✓	✓	✓	✓	✓	✓	✓	262	✓	✓	126.24	✓	124.77	✓	✓	✓	✓	126.25	No P	1130	
5	2	✓	✓	✓	✓	✓	✓	✓	262	✓	✓	126.20	✓	107.67	✓	✓	✓	✓	107.21	1000	8/4	
6	1	✓	✓	✓	✓	✓	✓	✓	262	✓	✓	108.80	✓	107.67	✓	✓	✓	✓	107.56	PROBLEM!	1145	
6	2	✓	✓	✓	✓	✓	✓	✓	262	✓	✓	108.80	✓	107.67	✓	✓	✓	✓	107.56	PROBLEM!	1145	
7	1	✓	✓	✓	✓	✓	✓	✓	187	✓	✓	83.23	✓	81.81	✓	✓	✓	✓	83.23	—	8/3	
7	2	✓	✓	✓	✓	✓	✓	✓	187	✓	✓	93.22	✓	81.80	✓	✓	✓	✓	93.22	—	8/3	
7	3	✓	✓	✓	✓	✓	✓	✓	187	✓	✓	83.20	✓	81.81	✓	✓	✓	✓	93.19	—	8/3	
8	1	✓	✓	✓	✓	✓	✓	✓	187	✓	✓	64.71	✓	64.90	✓	✓	✓	✓	64.71	1000	8/4	
9	1	✓	✓	✓	✓	✓	✓	✓	102	✓	✓	45.10	✓	45.63	✓	✓	✓	✓	45.10	1200	8/4	
10	1	✓	✓	✓	✓	✓	✓	✓	47	✓	✓	21.09	✓	22.77	✓	✓	✓	✓	21.09	1200	8/4	

Additional Comments: (pH, turbidity, S.C., etc.)

1 2 3 4 5 6 7 8 9 10  
482 402 352 307 287 247 187 147 102 47

DNW: A) WELL \_\_\_\_\_ B) AWARER \_\_\_\_\_  
 NOTE: 6/13/09 MWSAC UNIT OUT DURING  
 ON 6/13/09; NEW UNIT DELIVERED 8/4/09

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

### **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

mS/cm<sup>-1</sup> - milli-Siemens per centimeter

**NTU - nephrolometric turbidity unit**

ANSWER

meter  
unit  
(610) WB TECH  
GEORGE  
405-0240

# Earth Data

(610) 524-9466

11530

FEDEX  
570 STEWART AVE.

GC, NY

# Groundwater Sampling

## Field Data Sheet

Project: ROOSEVELT  
 Monitoring Well No.: SUP 11  
 Sampling Zone No(s.): 1-10

Date: JULY 30, 2009  
 Start Time: 8:00 Atm. Rdg: 14.47  
 End Time: 14:05 Atm. Rdg: 14.49  
 Operators: MJE & TEE

Port No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler		Sample Collection Checks (probe located at sampling zone in Westbay casing)							Comments (volume recovered)		
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Apply Vacuum	Close Valve	Locate Port	Arm Out	Land Probe	Pressure in Westbay ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in Westbay ( )	
1	1	✓	✓	✓	✓	✓	✓	482	✓	✓	213.90	✓	210.94	✓	210.95	✓	✓	213.85	848
1	2	✓	✓	✓	✓	✓	✓	482	✓	✓	213.81	✓	210.94	✓	210.94	✓	✓	213.81	1
1	3	✓	✓	✓	✓	✓	✓	482	✓	✓	213.70	✓	211.00	✓	211.00	✓	✓	213.70	1
2	1	✓	✓	✓	✓	✓	✓	402	✓	✓	177.87	✓	175.94	✓	175.93	✓	✓	177.87	900
3	1	✓	✓	✓	✓	✓	✓	352	✓	✓	157.04	✓	154.80	✓	154.76	✓	✓	157.00	1045
3	2	✓	✓	✓	✓	✓	✓	352	✓	✓	156.98	✓	154.71	✓	154.73	✓	✓	156.98	1
3	3	✓	✓	✓	✓	✓	✓	352	✓	✓	156.92	✓	154.71	✓	154.77	✓	✓	156.92	1
3	4	✓	✓	✓	✓	✓	✓	352	✓	✓	156.86	✓	154.81	✓	154.80	✓	✓	156.84	1
3	5	✓	✓	✓	✓	✓	✓	352	✓	✓	156.81	✓	154.79	✓	154.77	✓	✓	156.32	1
4	1	✓	✓	✓	✓	✓	✓	307	✓	✓	136.17	✓	135.70	✓	135.70	✓	✓	136.17	1105
5	1	✓	✓	✓	✓	✓	✓	287	✓	✓	127.49	✓	127.07	✓	127.00	✓	✓	127.49	1125
6	1	✓	✓	✓	✓	✓	✓	247	✓	✓	110.98	✓	109.80	✓	109.86	✓	✓	110.98	1300
6	2	✓	✓	✓	✓	✓	✓	247	✓	✓	110.92	✓	109.85	✓	109.86	✓	✓	110.92	1
6	3	✓	✓	✓	✓	✓	✓	247	✓	✓	110.01	✓	109.84	✓	109.80	✓	✓	110.05	1
7	1	✓	✓	✓	✓	✓	✓	187	✓	✓	83.74	✓	84.09	✓	84.09	✓	✓	83.74	1315

Additional Comments: (pH, turbidity, S.C., etc.)

1 2 3 4 5 6 7 8 9 10  
482 402 352 307 287 247 187 147 102 47

DNW: A) WELL ————— B) Surface —————  
PAGE 1 OF 2

## **Groundwater Sampling**

### **Field Data Sheet**

Project: SVP-II

**Monitoring Well No.:** \_\_\_\_\_

**Sampling Zone No(s).:** \_\_\_\_\_

Date: JULY 30, 2007  
Start Time: \_\_\_\_\_ Atm. Rdg: \_\_\_\_\_  
End Time: \_\_\_\_\_ Atm. Rdg: \_\_\_\_\_  
Operators: \_\_\_\_\_

Additional Comments: (pH, turbidity, S.C., etc.)

DW: A) Well \_\_\_\_\_ B) Answer \_\_\_\_\_  
PAGE 2 OF 2

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

#### **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

mS/cm<sup>c</sup> - milli-Siemens per centimeter

### **NTU - nephrolometric turbidity unit**

# Groundwater Sampling

## Field Data Sheet

Project: ROOSEVELT  
 Monitoring Well No.: S-12  
 Sampling Zone No(s.): 1-6

Date: July 29, 2019  
 Start Time: 9:00 Atm. Rdg: 14.48  
 End Time: 12:00 Atm. Rdg: 14.57  
 Operators: MTE & J. LEE

Part No.	Run No. 402407	Surface Function Tests (probe in flushing collar)						Position Sampler	Sample Collection Checks (probe located at sampling zone in Westbay casing)							Comments (volume recovered)				
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Apply Vacuum	Close Valve		Locate Port	Arm Out	Land Probe	Pressure in Westbay ( )	Shoe Out	Zone Pressure ( )	Open Valve	Zone Pressure ( )	Close Valve	Shoe In	Pressure in Westbay ( )	
1	1	V	V	V	V	V	V	515	V	V	V	229.90	V	225.01	V	225.63	V	V	229.81	8:30
2	1	V	V	V	V	V	V	485	V	V	V	217.85	V	212.93	V	212.93	V	V	217.85	8:30
2	2	V	V	V	V	V	V	485	V	V	V	217.74	V	212.94	V	212.91	V	V	217.74	1
2	3	V	V	V	V	V	V	485	V	V	V	217.48	V	212.90	V	212.90	V	V	217.60	1
2	4	V	V	V	V	V	V	485	V	V	V	217.48	V	212.90	V	212.89	V	V	216.49	1
3	1	V	V	V	V	V	V	485	V	V	V	181.04	V	178.74	V	178.75	V	V	181.84	G45
4	1	V	V	V	V	V	V	355	V	V	V	161.08	V	157.60	V	157.60	V	V	161.08	1100
4	2	V	V	V	V	V	V	355	V	V	V	161.01	V	157.60	V	157.59	V	V	161.00	
4	3	V	V	V	V	V	V	355	V	V	V	160.93	V	157.59	V	157.00	V	V	160.92	
4	4	V	V	V	V	V	V	355	V	V	V	159.86	V	157.58	V	157.58	V	V	159.86	
5	1	V	V	V	V	V	V	295	V	V	V	133.76	V	130.95	V	131.95	V	V	133.77	1130
6	1	V	V	V	V	V	V	245	V	V	V	112.92	V	110.37	V	110.37	V	V	112.92	1230
6	2	V	V	V	V	V	V	245	V	V	V	112.87	V	110.37	V	110.37	V	V	112.85	
6	3	V	V	V	V	V	V	245	V	V	V	112.82	V	110.36	V	110.36	V	V	112.80	
6	4	V	V	V	V	V	V	245	V	V	V	112.73	V	110.37	V	110.37	V	V	112.73	

Additional Comments: (pH, turbidity, S.C., etc.)

SW: A) WELL \_\_\_\_\_ B) AVERAGE \_\_\_\_\_

1 2 3 4 5 6  
 515 485 405 355 295 245

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

#### **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

mS/cm<sup>2</sup> - milli-Siemens per centimeter

**NTU - nephrolometric turbidity unit**

# Groundwater Sampling

## Field Data Sheet

Project: ROOSEVELT  
 Monitoring Well No.: SWP 13  
 Sampling Zone No(s.): 1-6

Date: JULY 28, 2009  
 Start Time: 7:55 Atm. Rdg: 14.56  
 End Time: 12:45 Atm. Rdg:   
 Operators: MATE & JLEE

Port No.	Run No.	Surface Function Tests (probe in flushing collar)						Position Sampler		Sample Collection Checks (probe located at sampling zone in Westbay casing)							Comments (volume recovered)		
		Shoe Out	Close Valve	Check Vacuum	Open Valve	Apply Vacuum	Close Valve	Locate Port	Arm Out	Land Probe	Pressure in Westbay (psi)	Shoe Out	Zone Pressure (psi)	Open Valve	Zone Pressure (psi)	Close Valve	Shoe In	Pressure in Westbay (psi)	
1	1	✓	✓	✓	✓	✓	✓	520	✓	✓	240.30	✓	229.25	✓	229.25	✓	✓	240.30	810
2	1	✓	✓	✓	✓	✓	✓	495	✓	✓	225.18	✓	214.15	✓	214.15	✓	✓	225.18	915
2	2	✓	✓	✓	✓	✓	✓	495	✓	✓	225.02	✓	214.14	✓	214.14	✓	✓	225.02	1
2	3	✓	✓	✓	✓	✓	✓	495	✓	✓	224.71	✓	214.12	✓	214.13	✓	✓	224.71	1
2	4	✓	✓	✓	✓	✓	✓	495	✓	✓	224.12	✓	214.12	✓	214.12	✓	✓	224.12	1
2	5	✓	✓	✓	✓	✓	✓	355	✓	✓	167.99	✓	158.26	✓	158.26	✓	✓	167.99	1045
4	1	✓	✓	✓	✓	✓	✓	355	✓	✓	167.88	✓	158.27	✓	158.27	✓	✓	167.88	1
4	2	✓	✓	✓	✓	✓	✓	355	✓	✓	167.79	✓	158.27	✓	158.27	✓	✓	167.79	1
4	3	✓	✓	✓	✓	✓	✓	355	✓	✓	167.79	✓	158.27	✓	158.27	✓	✓	167.79	1
4	4	✓	✓	✓	✓	✓	✓	355	✓	✓	167.70	✓	158.27	✓	158.27	✓	✓	167.70	1
6	1	✓	✓	✓	✓	✓	✓	245	✓	✓	119.71	✓	110.95	✓	110.94	✓	✓	119.71	1200
6	2	✓	✓	✓	✓	✓	✓	245	✓	✓	119.66	✓	110.93	✓	110.93	✓	✓	119.66	
6	3	✓	✓	✓	✓	✓	✓	245	✓	✓	119.67	✓	110.95	✓	110.95	✓	✓	119.67	
6	4	✓	✓	✓	✓	✓	✓	245	✓	✓	119.54	✓	110.94	✓	110.95	✓	✓	119.54	
6	5	✓	✓	✓	✓	✓	✓	245	✓	✓	119.00	✓	110.91	✓	110.95	✓	✓	119.00	
3	1	✓	✓	✓	✓	✓	✓	405	✓	✓	188.05	✓	179.79	✓	179.79	✓	✓	188.07	12
											32.46	✓	32.46	✓	32.46	✓	✓	32.46	1240

Additional Comments: (pH, turbidity, S.C., etc.)

DW: A) WELL \_\_\_\_\_ B) AQUIFER \_\_\_\_\_

1 2 3 4 5 6  
520 495 405 355 295 245

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

#### **Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

mS/cm<sup>2</sup> - milli-Siemens per centimeter

### **NTU - nephrolometric turbidity unit**

July 30, 2009

## **Old Roosevelt Field Remedial Design Multiport Well Water Quality Parameters**

Well No. Supply Well NO. 10 TAP

---

**Acronyms:**

°C - degrees Celsius

mg/L - milligrams per Liter

**mS/cm<sup>c</sup>** - milli-Siemens per centimeter

**NTU - nephrolometric turbidity unit**

## **Old Roosevelt Field Remedial Design Multiport Well Water Quality Parameters**

July 30, 2009

~~Export Well Water Quality Parameters~~  
Well No. Supply Well No. 11 Daf

#### **Acronyms:**

•C - degrees Celsius

mg/L - milligrams per Liter

**mS/cm<sup>c</sup>** - milli-Siemens per centimeter

### **NTU - nephrolometric turbidity unit**

**Old Roosevelt Field Remedial Design  
Multiport Well Water Quality Parameters**

AIR SUPPLY  
INFLOW AT

585  
STEWART  
Ave.  
Blog.

#### **Acronyms:**

°C - degrees Celsius

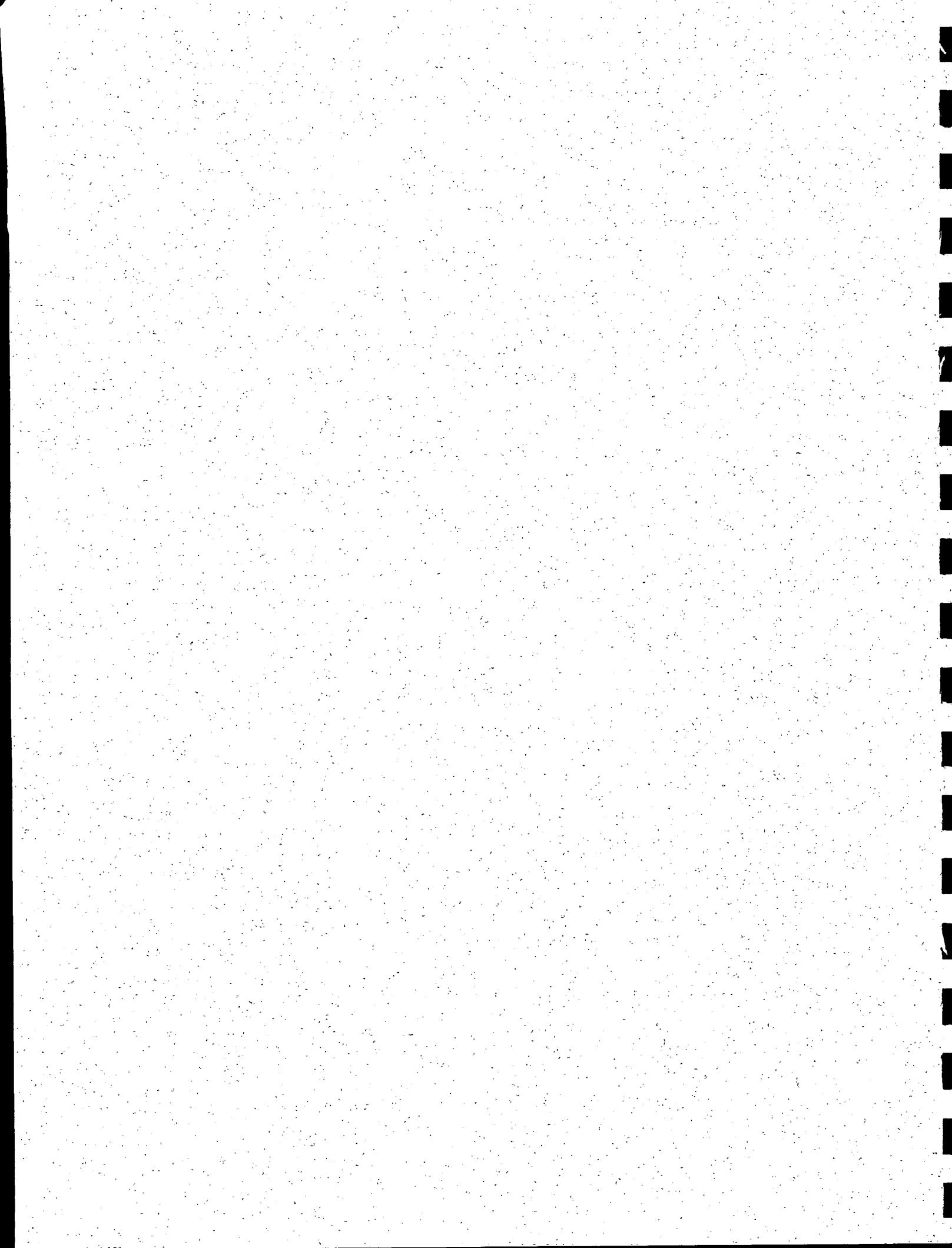
mg/L - milligrams per Liter

**mS/cm<sup>c</sup>** - milli-Siemens per centimeter

**NTU - nephrolometric turbidity unit**



## Appendix G



**Appendix G**

**Existing Monitoring Well and Supply Well Low-Flow**

**Sampling Sheets**

P. 1 of 2

Low Flow  
Sampling

## DEVELOPMENT SUMMARY SHEET

DTW: 30.7' bas from  
top of ground

DATE: 7/24/09

WELL #: GWT 10019

TIME: 08:35

DEPTH OF PUMP:

CDM Personnel: Sean O'Hare

WEATHER CONDITIONS: Sunny ~ 73°F

ELAPSE D TIME (min)	VOLUME PURGED (gals)	DEPTH TO WATER (FT TIC)	FLOW RATE (gpm) ml/min	pH (± 0.1 SU)	SPECIFIC COND. mS/cm (± 3%)	TURBIDITY NTUs (± 10%)	DISSOLVE D OXYGEN mg/L (± 10%)	TEMP. °C (± 10%)	REDOX POTENTIAL mV (± 10 mv)	OBSERVATIONS
08:40		30.7		→ Begin	Purge	ng				
08:50	1	30.6	400	6.88	0.222	18	1.08	16.52	-13	
09:00	2	30.6	400	7.75	0.250	13	1.00	16.45	-44	
09:20				Technical Problems with Horiba U-22	→ called PINE					
09:30	→			Started/Continued Purge						
09:30	—	30.4	400	8.54	0.245	23	1.38	16.28	-58	
09:40	3	30.4	400	8.87	0.228	19	0.80	16.42	-117	
09:50	4	30.4	400	8.97	0.217	27	0.46	16.69	-155	
10:09	5	30.4	400	9.00	0.210	30	0.22	16.70	-181	
10:19	6	30.4	400	9.03	0.206	30	0.16	16.76	-189	
10:29	7	30.4	400	9.04	0.206	32	0.08	16.79	-202	
10:30	8	30.4	400	9.04	0.206	32	0.03	16.87	-210	
10:35	8.5	30.4	400	9.04	0.205	32	0.00	16.89	-212	

P. 2 of 2

*low flow*  
*sampling*

**DEVELOPMENT SUMMARY SHEET**

**DATE:** 7/24/09

WELL #: Gw x 10019

**DEPTH OF PUMP:**

**CDM Personnel:** Sem O'Hare

## TIME:

**WEATHER CONDITIONS:** Sunny ~ 73°F

p. 1 of 2

Old Roosevelt Field Contaminated Groundwater Area Site  
LOW FLOW GROUNDWATER SAMPLING PURGE RECORD

DATE: 8/24/09

WELL #: GW X 10020

SAMPLERS: Sean O'Hare

DEPTH OF PUMP INTAKE:  TIC or ft BGS (circle one)

WEATHER CONDITIONS: Sunny ~ 80°F

SCREENED/OPEN BOREHOLE INTERVAL:  ft TIC or ft BGS (circle one)

SAMPLE ID: GW X - 10020 - R4

SAMPLE TIME: 13:55 SAMPLE FLOW RATE: 400 ml/min ml/minute

CLP ID: BS991

Instrument Type/Model:  
Complete and/or Circle at right

YSI Model # 600 XL / Horiba U-22

(circle one) ft TIC or ft BGS (circle one)

CURRENT TIME	VOLUME PURGED	DEPTH TO WATER	FLOW RATE	DRAWDOWN (± 0.3 FT)	pH (± 0.1 SU)	SPECIFIC CONDUCTIVITY (± 3%)	DISSOLVED OXYGEN (± 10%)	TEMP. (± 10%)	REDOX POTENTIAL (± 10 mV)	Instrument:	
										Instrument:	TURBIDITY (± 10%)
24-Hour	<input checked="" type="checkbox"/> gallons <input type="checkbox"/> liters (circle one)	ft TIC / ft BGS (circle one) <small>Units: ft bas or</small>	Units: ml/min	ft TIC / ft BGS (circle one)	SU	S/cm, <input checked="" type="checkbox"/> mS/cm or <input type="checkbox"/> µS/cm (circle one)	mg/L <input checked="" type="checkbox"/> (not %)	Units: °C	mV	NTUs	
12:15 → Stabilized	26.5'	400	—	—	7.0						
12:40	2.5	27.0'	400	0.5'	7.12	0.388	0.40	16.61	-196	13	
12:50	3.5	27.0'	400	—	7.19	0.335	0.59	16.71	-144.5	12	
13:00	4.5	27.0'	400	—	7.03	0.388	1.15	15.92	+128.1	12	
13:10	5.5	27.0'	400	—	6.67	0.395	0.65	15.93	147.3	11	
13:20	6.5	27.0'	400	—	6.15	0.395	0.52	16.22	285.3	9.9	
13:30	7.5	27.0'	400	—	5.96	0.395	0.46	15.83	297.8	9.9	
13:35	8.0	27.0'	400	—	6.00	0.394	0.43	15.82	286.5	9.8	
13:40	8.5	27.0'	400	—	6.05	0.395	0.43	16.02	284.5	8.9	
13:45	9.0	27.0'	400	—	6.02	0.395	0.41	15.75	285.1	8.8	

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L

Redox Potential = -100 - +600 mV

Turbidity = 0 - &gt;500 NTUs

Spec. Conductivity (µS/cm) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000 µS/cm = 1 mS/cm

TIC = Top of Inner Casing

BGS = Below Ground Surface

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**Old Roosevelt Field Contaminated Groundwater Area Site  
LOW FLOW GROUNDWATER SAMPLING PURGE RECORD**

**DATE:**

#### **SAMPLERS:**

**WEATHER CONDITIONS:**

**SAMPLE ID:**

CLP ID:

## SAMPLE TIME

**SAMPLE FLOW RATE:**

ml/minute

## **DEPTH OF PUMP INTAKE:**

#### **SCREENED/OPEN BOREHOLE INTERVALS**

**ft TIC or ft BGS  
(circle one)**

Drawdown is not to exceed 0.3 feet. Flow rate should not exceed 500 ml/min during purging or 250 ml/min during sampling. Readings should be taken every three to five minutes. The well is considered stabilized and ready for sampling when the indicator parameters have stabilized for three consecutive readings by the measurements indicated in parenthesis.

Typical values: DO = 0.3 - 10 mg/L

**Redox Potential = -100 - +600 mV**

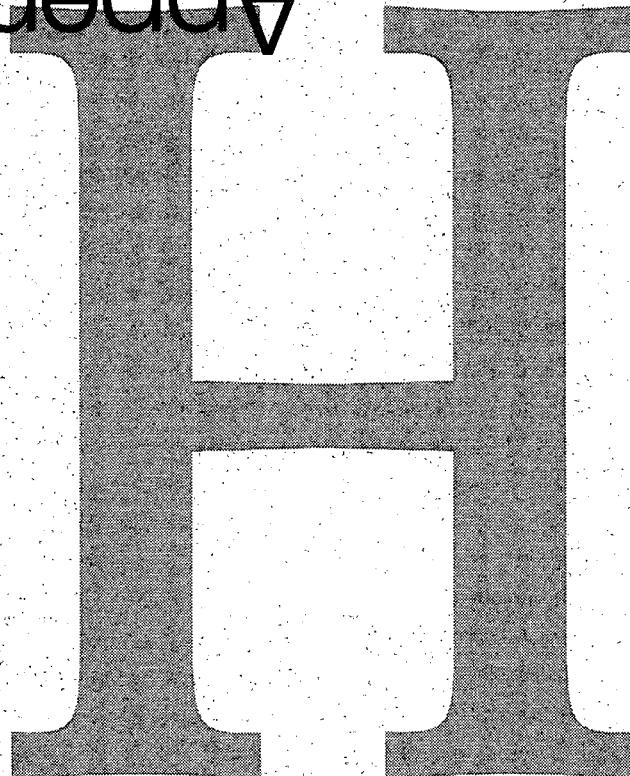
Turbidity = 0 - >500 NTUs

Spec. Conductivity ( $\mu\text{S}/\text{cm}$ ) = 0.01 - 5,000; up to 10,000 in industrial, ~55,000 in high salt content water. Note: 1,000  $\mu\text{S}/\text{cm}$  = 1 mS/cm

TIC = Top of Inner Casing

**BGS = Below Ground Surface**

# H Appendix



## **Appendix H**

### **Full Sample Result Data Tables**

Old Roosevelt  
Round 4 Groundwater Sampling  
Trace Volatile Organic Compounds

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-01-10-R4	GWM-01-1-R4	GWM-01-2-R4	GWM-01-3-R4	GWM-01-4-R4
			Sample Name	Sample Date	7/22/2009	7/22/2009	7/22/2009	7/22/2009
(Group Code)	(Group Description)		Unit \ Depth	50 to 55 ft	450 to 455 ft	400 to 405 ft	370 to 375 ft	315 to 320 ft
127-18-4	Volatile Organic Compounds	Trace-V	ug/L	0.5 U	0.5 U	0.4 J	0.65	0.47 J
79-01-6	Tetrachloroethene	Trace-V	ug/L	0.5 U	0.61	0.7	0.92	0.37 J
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.34 J	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.3 J	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.5 U	1.1	1.3	5.1	51
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 U	0.56	1.4	1.2 J	0.5 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	1.2
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	0.5 U	0.5 U	0.68	2.6	12
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 U	3.3	4.3	4.3	1.9
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-83-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L	0.5 U	0.5 U	0.51	0.56	0.5 U
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.63	1.2	1	0.31 J
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
123-91-1	1,4-Dioxane	Trace-V	ug/L					
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-6	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Old Roosevelt  
Round 4 Groundwater Sampling  
Trace Volatile Organic Compounds

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-01-5-R4	GWM-01-6-R4	GWM-01-7-R4	GWM-01-8-R4	GWM-01-9-R4
			Sample Name	7/22/2009	7/22/2009	7/22/2009	7/22/2009	7/22/2009
			Sample Date	290 to 295 ft	250 to 255 ft	200 to 205 ft	150 to 155 ft	100 to 105 ft
<b>(Group Code) (Group Description)</b>								
<b>1-Trace-V</b> <b>Volatile Organic Compounds</b>								
127-18-4	Tetrachloroethene	Trace-V	ug/L	0.36 J	0.5 U	0.5 U	0.5 U	0.5 U
79-01-6	Trichloroethene	Trace-V	ug/L	0.35 J	0.5 U	0.5 U	0.5 U	0.5 U
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U				
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U				
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U				
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U				
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U				
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	62	20	0.5 U	0.5 U	0.5 U
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 U				
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	2.2	0.66	0.5 U	0.5 U	0.5 U
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U				
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U				
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U				
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U				
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	19	2.7	0.5 U	0.5 U	0.5 U
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	1.7	0.43 J	0.5 U	0.5 U	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.5 U				
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U				
67-66-3	Chloroform	Trace-V	ug/L	0.5 U				
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.29 J	0.5 U	0.5 U	0.5 U	0.5 U
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U				
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U				
71-43-2	Benzene	Trace-V	ug/L	0.5 U				
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U				
123-91-1	1,4-Dioxane	Trace-V	ug/L					
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U				
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U				
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U				
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U				
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U				
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U				
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U				
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U				
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U				
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U				
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U				
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U				
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U				
100-42-5	Styrene	Trace-V	ug/L	0.5 U				
75-25-2	Bromoform	Trace-V	ug/L	0.5 U				
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U				
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L	0.5 U				
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U				
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.26 J	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U				
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U				
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U				
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U				

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Trace Volatile Organic Compounds

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-02-10-R4	GWM-02-1-R4	GWM-02-2-R4	GWM-02-3-R4
			Sample Name	Sample Date	7/22/2009	7/22/2009	7/22/2009
(Group Code)	(Group Description)		Unit \ Depth	50 to 65 ft	450 to 455 ft	410 to 415 ft	370 to 375 ft
127-18-4	Tetrachloroethene	Trace-V	ug/L	0.5 U	1.5	3.1	3.6
79-01-6	Trichloroethene	Trace-V	ug/L	0.93	15	14	18
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U	2.9	0.78	0.98
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.5 U	110	18	2.1
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	3.5	0.73	0.5 U
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl-Tert-Butyl Ether	Trace-V	ug/L	0.5 U	0.54	2.2	1.2
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 U	0.91	1 J	0.31 J
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	1	2	2.9
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
71-55-8	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.3 J	0.5 U
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
123-91-1	1,4-Dioxane	Trace-V	ug/L				
108-87-2	Metylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U

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Cas Rn	Chemical Name	Analytic Method	Sample Code Sample Name Sample Date Unit \ Depth	GWM-02-4-R4R		GWM-02-5-R4		GWM-02-6-R4		GWM-02-7-R4		GWM-02-8-R4			
				7/27/2009 330 to 335 ft	7/22/2009 290 to 295 ft	7/22/2009 250 to 255 ft	7/22/2009 190 to 195 ft	7/22/2009 150 to 155 ft	7/22/2009 190 to 195 ft	7/22/2009 150 to 155 ft	7/22/2009 190 to 195 ft	7/22/2009 150 to 155 ft			
<b>(Group Code) (Group Description)</b>															
1-Trace-V	<b>Volatile Organic Compounds</b>														
127-18-4	Tetrachloroethene	Trace-V	ug/L	5.4	3.8 J	3.8		2.8		2.4 J					
79-01-6	Trichloroethene	Trace-V	ug/L	21 J	23	19		12		18 J					
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	1.1	0.92	1.6		1.4		1.1 J					
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.36 J	0.45 J	0.29 J		0.5 U		0.5 U					
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U		0.5 U		0.5 U					
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U		5 UJ		5 U					
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.33 J	0.5 U	0.69		0.5 U		0.5 U					
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	0.45 J	0.48 J	0.38 J		0.5 U		0.38 J					
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 UJ		0.5 U					
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	5.2 J	4.6	5		5		0.5 U					
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U		5 UJ		5 U					
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 UJ		0.5 U					
67-66-3	Chloroform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 UJ		0.5 U					
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
123-91-1	1,4-Dioxane	Trace-V	ug/L												
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U		5 U		5 U					
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U		5 U		5 U					
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 UJ		0.5 U					
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
100-42-5	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
75-25-2	Bromoform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 UJ		0.5 U					
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U		0.5 U		0.5 U					

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-02-9-R4	GWM-03-1-R4	GWM-03-2-R4	GWM-03-3-R4	GWM-03-4-R4
			Sample Name	Sample Date	7/22/2009	7/23/2009	7/23/2009	7/23/2009
(Group Code)	(Group Description)		Unit \ Depth	100 to 105 ft	450 to 455 ft	390 to 395 ft	370 to 375 ft	290 to 295 ft
127-18-4	Tetrachloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.29 J
79-01-6	Trichloroethene	Trace-V	ug/L	39	8.3	30	19	0.72
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	3 J
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U				
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U				
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U				
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U				
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.5 U	180 J	34	11	0.37 J
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 UJ	0.74	1.1	0.72	0.5 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	3	0.5 U	0.5 U	0.5 U
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U				
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U				
75-09-2	Methylene Chloride	Trace-V	ug/L	0.36 J	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	3.8	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 U	2.7	3.1	1.9	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.75 J	0.5 U	0.48 J	0.5 U	0.5 U
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U				
67-66-3	Chloroform	Trace-V	ug/L	0.5 U				
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.56	0.73	0.58	0.5 U
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U				
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U				
71-43-2	Benzene	Trace-V	ug/L	0.5 U				
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U				
123-91-1	1,4-Dioxane	Trace-V	ug/L					
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U				
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U				
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U				
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U				
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U				
10061-02-8	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U				
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U				
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U				
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U				
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U				
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U				
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U				
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U				
100-42-5	Styrene	Trace-V	ug/L	0.5 U				
75-25-2	Bromoform	Trace-V	ug/L	0.5 U				
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U				
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L	0.5 U				
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U				
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U				
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U				
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U				
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U				
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U				

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-03-5-R4	GWM-03-6-R4	GWM-03-7-R4	GWM-04-10-R4	GWM-04-1-R4
			Sample Name	7/23/2009	7/23/2009	7/23/2009	7/23/2009	7/23/2009
			Sample Date	7/23/2009	7/23/2009	7/23/2009	7/23/2009	7/23/2009
<b>(Group Code) (Group Description)</b>								
<b>1-Trace-V Volatile Organic Compounds</b>								
127-18-4	Tetrachloroethene	Trace-V	ug/L	0.38 J	0.49 J	0.32 J	0.5 U	25
79-01-6	Trichloroethene	Trace-V	ug/L	0.66	0.5 U	0.5 U	0.5 U	14
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	3.6	0.5 U	0.5 U	0.5 U	2
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.25 J
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	12 J
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.6 U	0.5 U	0.5 U	0.5 U	1.7
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-64-1	Acetone	Trace-V	ug/L	5 U	4.2 J	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	11 J
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	260	2.1	0.5 U	0.5 U	0.81 J
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.87	0.5 U	0.5 U	0.5 U	3.1
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.91
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	1.9
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	1 J
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.49 J
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
123-91-1	1,4-Dioxane	Trace-V	ug/L					
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-04-2-R4	GWM-04-3-R4	GWM-04-4-R4	GWM-04-5-R4	GWM-04-5-R4-DUP
			Sample Name	Sample Date	7/23/2009	7/23/2009	7/23/2009	GWM-104-5-R4
(Group Code)	(Group Description)		Unit \ Depth	400 to 405 ft	350 to 355 ft	305 to 310 ft	7/23/2009	7/23/2009
<b>Volatile Organic Compounds</b>								
127-18-4	Tetrachloroethene	Trace-V	ug/L	27	110	100	83	91
79-01-6	Trichloroethene	Trace-V	ug/L	13	37	41	30	34
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	1.1	14	9.5	15	11
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	13	0.59	0.5 UJ	0.5 UJ	0.5 UJ
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	1	1.2	0.92	1.4	0.93
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
87-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl (tert-Butyl Ether	Trace-V	ug/L	0.47 J	5.2	3.5 J	3.4 J	3.4 J
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	1.9	0.44 J	0.26 J	0.31 J	0.5 UJ
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.87	2.9	2.3	2.6	2.1
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
67-66-3	Chloroform	Trace-V	ug/L	1.2	0.5 U	0.5 U	0.5 U	0.5 UJ
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.65	0.37 J	0.29 J	0.45 J	0.3 J
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.63	0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.36 J	0.33 J	0.32 J	0.31 J
123-91-1	1,4-Dioxane	Trace-V	ug/L					
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Cas Rn (Group Code)	Chemical Name (Group Description)	Analytic Method	Sample Code	GWM-04-6-R4	GWM-04-7-R4	GWM-04-8-R4	GWM-04-9-R4	GWM-05-10-R4
			Sample Name	Sample Date 7/23/2009 245 to 250 ft	7/23/2009 185 to 190 ft	7/23/2009 145 to 150 ft	7/23/2009 100 to 105 ft	7/24/2009 45 to 50 ft
<b>Volatile Organic Compounds</b>								
127-18-4	Tetrachloroethene	Trace-V	ug/L	120	10	10	4	0.5 U
79-01-6	Trichloroethene	Trace-V	ug/L	44	27	25	1.3	0.5 U
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	5.9	1.5	0.37 J	0.5 U	0.5 U
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.58	0.5 U	0.5 U	0.5 U	0.5 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	3.9 J	4.7	3.4	0.5 U	0.5 U
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	2.8	0.66 J	0.45 J	0.26 J	0.5 U
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.6 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.34 J	0.34 J	0.26 J	0.5 U	0.5 U
123-91-1	1,4-Dioxane	Trace-V	ug/L					
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179801-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-48-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Cas Rn (Group Code)	Chemical Name (Group Description)	Analytic Method	Sample Code	GWM-05-1-R4	GWM-05-2-R4	GWM-05-3-R4	GWM-05-4-R4	GWM-05-5-R4
			Sample Name	Sample Date	7/24/2009	7/24/2009	7/24/2009	7/24/2009
			Unit \ Depth	430 to 435 ft	405 to 410 ft	355 to 360 ft	310 to 315 ft	290 to 295 ft
127-18-4	Tetrachloroethene	Trace-V	ug/L	0.5 U	1	0.62	0.35 J	0.33 J
79-01-6	Trichloroethene	Trace-V	ug/L	4	43	4	7.7	6.1
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.4 J	1.2	29	1.8	1.4
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U				
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U				
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U				
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U				
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	9.9	2.3 J	0.5 U	0.30 J	0.29 J
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.6 UJ	0.5 U	0.5 U	0.5 U
67-84-1	Acetone	Trace-V	ug/L	5 U	6 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U				
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	0.5 U	0.5 UJ	3.9	6.3	4.5
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.26 J	0.5 U	1.9	0.88	0.74
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.45 J	1.6 J	0.37 J	0.52	0.52
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U				
67-66-3	Chloroform	Trace-V	ug/L	0.5 U				
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U				
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.25 J	1 J	0.5 U	0.5 U	0.5 U
71-43-2	Benzene	Trace-V	ug/L	0.5 U				
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
123-91-1	1,4-Dioxene	Trace-V	ug/L					
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U				
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U				
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U				
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U				
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.29 J	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U				
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U				
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U				
108-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U				
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U				
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U				
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U				
100-42-5	Styrene	Trace-V	ug/L	0.5 U				
75-25-2	Bromoform	Trace-V	ug/L	0.5 U				
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U				
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L	0.5 U				
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U				
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U				
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U				
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U				
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U				
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U				

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-05-6-R4	GWM-05-7-R4	GWM-05-8-R4	GWM-05-9-R4	GWM-06-1-R4
			Sample Name	Sample Date	7/24/2009	7/24/2009	7/24/2009	7/23/2009
(Group Code)	(Group Description)		Unit \ Depth	250 to 255 ft	180 to 195 ft	150 to 155 ft	95 to 100 ft	445 to 450 ft
<b>Volatile Organic Compounds</b>								
127-18-4	Tetrachloroethene	Trace-V	ug/L	0.33 J	0.5 U	0.5 U	0.5 U	0.5 U
79-01-6	Trichloroethene	Trace-V	ug/L	4.3	0.63	0.83	0.5 U	0.45 J
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.81	0.5 U	0.5 U	0.5 U	0.5 U
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	1.1	0.5 U	0.5 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.6 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	0.48 J	0.5 U	0.5 U	0.56	0.5 U
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.49 J	0.94	3.1	0.5 U	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.59	0.5 U	0.5 U	0.5 U	1.1
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.27 J	0.5 U	0.29 J
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
123-91-1	1,4-Dioxane	Trace-V	ug/L					
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Cas Rn	Chemical Name	Analytic/Method	Sample Code	GWM-06-2-R4	GWM-06-3-R4	GWM-06-4-R4	GWM-06-5-R4	GWM-06-6-R4
			Sample Name	Sample Date	7/23/2009	7/23/2009	7/23/2009	7/23/2009
(Group Code)	(Group Description)		Unit \ Depth	365 to 370 ft	245 to 250 ft	175 to 180 ft	100 to 105 ft	45 to 50 ft
127-18-4	Volatile Organic Compounds	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-01-6	Tetrachloroethene	Trace-V	ug/L	0.5 U	1.1	0.57	2.7	0.5 U
75-71-8	Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.58	0.5 U
74-87-3	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Vinyl Chloride	Trace-V	ug/L	0.5 U	2.2	4.2	18	0.5 U
75-00-3	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-35-4	Trichlorofluoromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
76-13-1	1,1-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-64-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-15-0	Acetone	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.29 J	0.5 U	0.5 U	0.5 U
75-09-2	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	Methyl tert-Butyl Ether	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.67	35	81	0.61
78-93-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 U	3 J	2.6 J	15 J	0.5 U
74-97-5	2-Butanone	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chlorobromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
71-55-6	Chloroform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
110-82-7	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	1.5	0.5 U
56-23-5	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
71-43-2	Carbon Tetrachloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
123-91-1	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-87-2	1,4-Dioxane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-88-3	4-Methyl-2-pentanone	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	Toluene	Trace-V	ug/L	0.5 U	0.36 J	0.25 J	0.27 J	370
79-00-5	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
124-48-1	2-Chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-93-4	Dibromochloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Bromoform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,1,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,1,2-Tetrafluoroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.26 J
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2-Dibromopropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-07-1-R4	GWM-07-2-R4	GWM-07-3-R4	GWM-07-4-R4	GWM-07-5-R4	GWM-07-6-R4
			Sample Name	Sample Date	8/4/2009	8/4/2009	8/4/2009	8/4/2009	8/4/2009
			Unit \ Depth	445 to 450 ft	425 to 430 ft	310 to 315 in	205 to 210 ft	100 to 105 ft	45 to 50 ft
<b>(Group Code) (Group Description)</b>									
1-Trace-V	Volatile Organic Compounds	Trace-V	ug/L						
127-18-4	Tetrachloroethene	Trace-V	ug/L	13	13	5.6	0.5 U	0.29 J	0.5 U
79-01-6	Trichloroethene	Trace-V	ug/L	15	30	14	0.5 U	0.38 J	0.5 U
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U	0.5 U				
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U				
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U				
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U				
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U				
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.5 U	0.51 J	0.87	0.5 U	0.5 U	0.5 U
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	13 J	23	0.27 J	0.5 U	0.5 U	0.5 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U				
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U				
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U				
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 UJ	0.4 J	0.5 UJ	0.5 U	0.5 U	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.3 J	1.1 J	0.99	0.5 U	0.5 U	0.5 U
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	6.5	11 J	0.5 U	0.5 U	0.5 U	0.5 U
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U				
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U				
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
123-91-1	1,4-Dioxane	Trace-V	ug/L						
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U				
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U				
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U				
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U				
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U				
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U				
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U				
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U				
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U				
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U				
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U				
100-42-5	Styrene	Trace-V	ug/L	0.5 U	0.5 U				
75-25-2	Bromoform	Trace-V	ug/L	0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U				
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U				
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U				
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U				
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U				
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U				
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U				
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U				

Old Roosevelt  
Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-08-1-R4	GWM-08-2-R4	GWM-08-3-R4	GWM-08-4-R4	GWM-08-5-R4
			Sample Name	Sample Date	7/31/2009	7/31/2009	7/31/2009	7/31/2009
(Group Code)	(Group Description)		Unit    Depth	435 to 440 ft	370 to 375 ft	235 to 240 ft	155 to 160 ft	100 to 105 ft
1-Trace-V	Volatile Organic Compounds							
127-18-4	Tetrachloroethylene	Trace-V	ug/L	8.2	27	28 J	27 J	51 J
79-01-6	Trichloroethene	Trace-V	ug/L	1.8	4.5	0.81	0.83	1.5
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U				
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U				
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U				
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U				
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U				
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 UJ
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 U				
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U				
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U				
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U				
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U				
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U				
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	0.5 U				
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 U				
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.49 J	0.5 U	0.5 U	0.31 J
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U				
67-88-3	Chloroform	Trace-V	ug/L	0.5 U				
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U				
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U				
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U				
71-43-2	Benzene	Trace-V	ug/L	0.5 U				
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U				
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U				
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.6 U
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U				
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.6 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 UJ	5 U	5 U	6 UJ
108-88-3	Toluene	Trace-V	ug/L	0.5 U				
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.6 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U				
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 UJ	5 U	5 U	5 UJ
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U				
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.6 U
108-80-7	Chlorobenzene	Trace-V	ug/L	0.5 U				
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U				
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U				
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U				
100-42-5	Styrene	Trace-V	ug/L	0.5 U				
75-25-2	Bromoform	Trace-V	ug/L	0.5 U				
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U				
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L	0.5 U				
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U				
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U				
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U				
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U				
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U				
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U				

Old Roosevelt  
Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

Cas Rn	Chemical Name	Analytic Method	Unit \ Depth	Sample Code	GWM-08-6-R4	GWM-09-10-R4	GWM-09-1-R4	GWM-09-2-R4	GWM-09-3-R4
				Sample Name	7/31/2009 45 to 50 ft	7/27/2009 45 to 50 ft	7/27/2009 480 to 485 ft	7/27/2009 400 to 405 ft	7/27/2009 350 to 355 cm
<b>(Group Code) (Group Description)</b>									
<b>1-Trace-V</b>	<b>Volatile Organic Compounds</b>								
127-18-4	Tetrachloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.71	0.62	1.4
79-01-6	Trichloroethene	Trace-V	ug/L		0.5 U	0.55	15	5.9	18
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-87-3	Chloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L		0.5 U	0.5 U	16	66	3
75-35-4	1,1-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	7.7 J	3.6
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L		0.5 U	0.5 U	0.28 J	2.7	0.5 U
67-64-1	Acetone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-34-3	1,1-Dichloroethane	Trace-V	ug/L		0.5 U	0.5 U	1.3	18	9.8
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.32 J	0.5 U
78-93-3	2-Butanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	5	2.3
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	4.6	2.8
110-82-7	Cyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.28 J	0.39 J
71-43-2	Benzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.27 J	0.5 U
108-87-2	Metylcylohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.35 J	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-81-6	1,2,3-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

Cas Rn	Chemical Name	Analytic Method	Unit \ Depth	Sample Code	GWM-09-4-R4	GWM-09-5-R4	GWM-09-6-R4	GWM-09-7-R4	GWM-09-8-R4
				Sample Name	Sample Date				
<b>(Group Code) (Group Description)</b>									
<b>1-Trace-V</b>	<b>Volatile Organic Compounds</b>								
127-18-4	Tetrachloroethene	Trace-V	ug/L		14	27	8	22	7.3
79-01-6	Trichloroethene	Trace-V	ug/L		5.3	17	180	120	580
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L		0.5 U	0.5 U	0.55	2.8	2.3 J
74-87-3	Chloromethane	Trace-V	ug/L		0.5 U				
75-01-4	Vinyl Chloride	Trace-V	ug/L		0.5 U				
74-83-9	Bromomethane	Trace-V	ug/L		0.5 U				
75-00-3	Chloroethane	Trace-V	ug/L		0.5 U				
75-69-4	Trichlorofluoromethane	Trace-V	ug/L		11	4	0.5 UJ	0.5 UJ	0.5 UJ
75-35-4	1,1-Dichloroethene	Trace-V	ug/L		0.61	0.6	1.1	2.2	1.8 J
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
67-64-1	Acetone	Trace-V	ug/L		5 U	5 U	5 U	0.85 J	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L		0.5 U				
79-20-9	Methyl Acetate	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
75-09-2	Methylene Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	12	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
75-34-3	1,1-Dichloroethane	Trace-V	ug/L		1.5	1.4	0.53	0.26 J	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L		0.43 J	1.5	27	2.7	4.3 J
78-93-3	2-Butanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L		0.5 U				
67-66-3	Chloroform	Trace-V	ug/L		0.49 J	0.41 J	0.5 U	0.5 U	0.5 U
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L		0.38 J	0.5 U	0.33 J	0.47 J	0.58 J
110-82-7	Cyclohexane	Trace-V	ug/L		0.5 U				
56-23-5	Carbon Tetrachloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
71-43-2	Benzene	Trace-V	ug/L		0.5 U	0.5 U	0.44 J	0.5 U	0.55
107-06-2	1,2-Dichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
108-87-2	Methylcyclohexane	Trace-V	ug/L		0.5 U				
78-87-5	1,2-Dichloropropane	Trace-V	ug/L		0.5 U				
75-27-4	Bromodichloromethane	Trace-V	ug/L		0.5 U				
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L		0.5 U				
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L		0.5 U				
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L		0.5 U				
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L		0.5 U				
591-78-6	2-Hexanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L		0.5 U				
106-93-4	1,2-Dibromoethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
108-90-7	Chlorobenzene	Trace-V	ug/L		0.5 U				
100-41-4	Ethylbenzene	Trace-V	ug/L		0.5 U				
95-47-6	o-Xylene	Trace-V	ug/L		0.5 U				
179601-23-1	m,p-Xylenes	Trace-V	ug/L		0.5 U				
100-42-5	Styrene	Trace-V	ug/L		0.5 U				
75-25-2	Bromoform	Trace-V	ug/L		0.5 U				
98-82-8	Isopropylbenzene	Trace-V	ug/L		0.5 U				
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L		0.5 U				
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L		0.5 U				
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L		0.5 U				
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L		0.5 U				
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L		0.5 U				
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L		0.5 U				
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L		0.5 U				

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Trace Volatile Organic Compounds

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Cas Rn	Chemical Name	Analytic Method	Unit \ Depth	Sample Code	GWM-09-9-R4	GWM-10-10-R4	GWM-10-1-R4	GWM-10-2-R4	GWM-10-3-R4
				Sample Name	7/27/2009	8/4/2009	8/3/2009	8/3/2009	8/3/2009
(Group Code)	(Group Description)				100 to 105 ft	45 to 50 ft	480 to 485 ft	400 to 405 ft	350 to 355 ft
1-Trace-V	Volatile Organic Compounds								
127-18-4	Tetrachloroethene	Trace-V	ug/L		4.1	0.5 U	1.4	31	300
79-01-6	Trichloroethene	Trace-V	ug/L		7.8	0.31 J	24	960	130
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L		0.5 U	0.5 U	0.27 J	0.36 U	39
74-87-3	Chloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L		0.5 U	0.5 U	0.53	2.1 J	0.5 U
75-35-4	1,1-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	4.9 J
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-64-1	Acetone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.68 J
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L		0.25 J	0.5 U	0.45 J	0.5 U	0.25 J
75-34-3	1,1-Dichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.91 J
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L		2.3	0.5 U	8 J	69	5.3 J
78-93-3	2-Butanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	1.6 J
110-82-7	Cyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.45 J	0.5 U
71-43-2	Benzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.71	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.38 J
108-87-2	Metylcylohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromo-chloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-81-6	1,2,3-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Old Roosevelt  
Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

Cas.Rn	Chemical Name	Analytic Method	Unit \ Depth	Sample Code	GWM-10-4-R4	GWM-10-5-R4	GWM-10-5-R4-DUP	GWM-10-6-R4	GWM-10-7-R4
				Sample Name	8/3/2009	8/3/2009	GWM-110-5-R4	8/4/2009	8/4/2009
<b>(Group Code) (Group Description)</b>									
1-Trace-V	Volatile Organic Compounds								
127-18-4	Tetrachloroethene	Trace-V	ug/L		2.7	1.9	1.6	0.5 U	3.4
79-01-6	Trichloroethene	Trace-V	ug/L		130	220	220	3	140
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L		2.3	1.1 J	1.1 J	0.5 U	0.5 U
74-87-3	Chloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L		3.3	4.9 J	4.3 J	0.29 J	0.5 U
75-35-4	1,1-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.32 J
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-64-1	Acetone	Trace-V	ug/L		5	5 U	5 U	5 U	1.3 J
75-15-0	Carbon Disulfide	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L		6.5	8.8 J	9.2 J	0.5 U	2.1 J
75-34-3	1,1-Dichloroethane	Trace-V	ug/L		0.5 U	0.21 J	0.5 U	0.5 U	0.43 J
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L		3.9	5 J	4.3 J	0.95	19 J
78-93-3	2-Butanone	Trace-V	ug/L		5	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L		0.5 U	0.5 U	0.21 J	0.5 U	0.5 U
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
110-82-7	Cyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L		0.5 U	0.26 J	0.5 U	0.5 U	0.29 J
71-43-2	Benzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L		0.29 J	0.4 J	0.5 U	0.5 U	0.5 U
108-87-2	Methylcyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

Cas Rn	Chemical Name	Analytic Method	Unit \ Depth	Sample Code	GWM-10-8-R4	GWM-10-9-R4	GWM-11-10-R4	GWM-11-1-R4	GWM-11-2-R4
				Sample Name	Sample Date	8/4/2009	8/4/2009	7/30/2009	7/30/2009
<b>(Group Code) (Group Description)</b>									
<b>1-Trace-V</b>	<b>Volatile Organic Compounds</b>								
127-18-4	Tetrachloroethene	Trace-V	ug/L		0.69	0.36 J	0.5 U	2.5	5.7
79-01-6	Trichloroethene	Trace-V	ug/L		44	3.9	0.5 U	430	19
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	3.4	0.49 J
74-87-3	Chloromethane	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L		0.27 J	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-35-4	1,1-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	1.2 J
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 J
67-64-1	Acetone	Trace-V	ug/L		5 U	5 U	7.2	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.52	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L		1.7	0.74	0.5 U	0.5 UJ	0.5 U
75-34-3	1,1-Dichloroethane	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L		7	0.41 J	0.5 U	120	1.1 J
78-93-3	2-Butanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U
67-66-3	Chloroform	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.33 J
110-82-7	Cyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.79 J	0.75
71-43-2	Benzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
108-87-2	Methylcyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-8	o-Xylene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179801-23-1	m,p-Xylenes	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 UJ	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

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Cas Rn (Group Code)	Chemical Name	Analytic Method	Unit \ Depth	Sample Code	GWM-11-3-R4	GWM-11-3-R4-DUP	GWM-11-4-R4	GWM-11-5-R4	GWM-11-6-R4
				Sample Name	7/30/2009	GWM-111-3-R4	7/30/2009	7/30/2009	7/30/2009
<b>Volatile Organic Compounds</b>									
127-18-4	Tetrachloroethene	Trace-V	ug/L		12 J	8.4 J	6.7	15	6
79-01-6	Trichloroethene	Trace-V	ug/L		270 J	250	180	160	97
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L		0.27 J	0.5 U	0.38 J	0.5 UJ	0.5 U
74-87-3	Chloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
75-35-4	1,1-Dichloroethene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
67-64-1	Acetone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 UJ
75-15-0	Carbon Disulfide	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
75-09-2	Methylene Chloride	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L		0.27 J	0.26 J	0.3 J	0.28 J	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
75-34-3	1,1-Dichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L		46 J	43	33	19	5.4
78-93-3	2-Butanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 UJ
74-97-5	Chlorobromomethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
67-66-3	Chloroform	Trace-V	ug/L		0.5 U	0.5 U	0.61	0.5 UJ	0.5 UJ
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
110-82-7	Cyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L		0.62	0.42 J	0.31 J	0.67 J	0.5 U
71-43-2	Benzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
108-87-2	Methylcyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromo-chloromethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 UJ
106-93-4	1,2-Dibromoethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 UJ
108-90-7	Chlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L		0.5 R	0.5 U	0.5 U	0.5 UJ	0.5 UJ
98-82-8	Isopropylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L		0.5 R	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L		0.5 R	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L		0.5 R	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L		0.5 R	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L		0.5 R	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L		0.5 R	0.5 U	0.5 U	0.5 U	0.5 U

Old Roosevelt  
Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

Cas Rn	Chemical Name	Analytic Method	Unit \ Depth	Sample Code	GWM-11-7-R4	GWM-11-8-R4	GWM-11-9-R4	GWM-12-1-R4	GWM-12-1-R4-DUP			
				Sample Name	7/30/2009	7/30/2009	7/30/2009	7/29/2009	GWM-112-1-R4			
<b>(Group Code) (Group Description)</b>												
<b>Volatile Organic Compounds</b>												
127-18-4	Tetrachloroethene	Trace-V	ug/L		1.3	0.34 J	0.5 U	0.52	0.66			
79-01-6	Trichloroethene	Trace-V	ug/L		6.4	0.99	0.5 U	4.9	6			
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L		0.5 U							
74-87-3	Chloromethane	Trace-V	ug/L		0.5 U							
75-01-4	Vinyl Chloride	Trace-V	ug/L		0.5 U							
74-83-9	Bromomethane	Trace-V	ug/L		0.5 U							
75-00-3	Chloroethane	Trace-V	ug/L		0.5 U							
75-89-4	Trichlorofluoromethane	Trace-V	ug/L		0.5 U							
75-35-4	1,1-Dichloroethene	Trace-V	ug/L		0.5 U							
78-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L		0.5 U							
67-64-1	Acetone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U			
75-15-0	Carbon Disulfide	Trace-V	ug/L		0.5 U							
79-20-9	Methyl Acetate	Trace-V	ug/L		0.5 U							
75-09-2	Methylene Chloride	Trace-V	ug/L		0.5 U							
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L		0.5 U							
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L		0.5 U							
75-34-3	1,1-Dichloroethane	Trace-V	ug/L		0.5 U							
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L		0.56	0.5 U	0.5 U	0.49 J	0.47 J			
78-93-3	2-Butanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U			
74-97-5	Chlorobromomethane	Trace-V	ug/L		0.5 U							
67-66-3	Chloroform	Trace-V	ug/L		0.5 U							
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L		0.5 U							
110-82-7	Cyclohexane	Trace-V	ug/L		0.5 U							
56-23-5	Carbon Tetrachloride	Trace-V	ug/L		0.5 U							
71-43-2	Benzene	Trace-V	ug/L		0.5 U							
107-06-2	1,2-Dichloroethane	Trace-V	ug/L		0.5 U							
108-87-2	Methylcyclohexane	Trace-V	ug/L		0.5 U							
78-87-5	1,2-Dichloropropane	Trace-V	ug/L		0.5 U							
75-27-4	Bromodichloromethane	Trace-V	ug/L		0.5 U							
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L		0.5 U							
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U			
108-88-3	Toluene	Trace-V	ug/L		0.5 U							
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L		0.5 U							
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L		0.5 U							
591-78-6	2-Hexanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U			
124-48-1	Dibromochloromethane	Trace-V	ug/L		0.5 U							
106-93-4	1,2-Dibromoethane	Trace-V	ug/L		0.5 U							
108-90-7	Chlorobenzene	Trace-V	ug/L		0.5 U							
100-41-4	Ethylbenzene	Trace-V	ug/L		0.5 U							
95-47-6	o-Xylene	Trace-V	ug/L		0.5 U							
179601-23-1	m,p-Xylenes	Trace-V	ug/L		0.5 U							
100-42-5	Styrene	Trace-V	ug/L		0.5 U							
75-25-2	Bromoform	Trace-V	ug/L		0.5 U							
98-82-8	Isopropylbenzene	Trace-V	ug/L		0.5 U							
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L		0.5 U							
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L		0.5 U							
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L		0.5 U							
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L		0.5 U							
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L		0.5 U							
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L		0.5 U							
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L		0.5 U							

Old Roosevelt  
Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

Cas Rn	Chemical Name	Analytic Method	Unit // Depth	Sample Code	GWM-12-2-R4	GWM-12-3-R4	GWM-12-4-R4	GWM-12-5-R4	GWM-12-6-R4
				Sample Name	7/29/2009	7/29/2009	7/29/2009	7/29/2009	7/29/2009
<b>(Group Code) (Group Description)</b>									
1-Trace-V	Volatile Organic Compounds								
127-18-4	Tetrachloroethene	Trace-V	ug/L		2.6	5.6	5.8	4.4	4.4
79-01-6	Trichloroethene	Trace-V	ug/L		43	90	95	24	24
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L		0.62	0.47 J	0.48 J	0.5 U	0.5 U
74-87-3	Chloromethane	Trace-V	ug/L		0.5 U				
75-01-4	Vinyl Chloride	Trace-V	ug/L		0.29 J	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L		0.5 U				
75-00-3	Chloroethane	Trace-V	ug/L		0.5 U				
75-69-4	Trichlorofluoromethane	Trace-V	ug/L		0.5 UJ	0.34 J	0.32 J	0.7	0.53
75-35-4	1,1-Dichloroethene	Trace-V	ug/L		0.5 UJ	0.82 J	0.73 J	0.5 UJ	0.5 UJ
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L		0.5 UJ	0.51 J	0.64 J	0.5 U	0.5 U
67-64-1	Acetone	Trace-V	ug/L		5 U	5 U	5 U	6.6	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L		0.5 U				
79-20-9	Methyl Acetate	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L		0.5 UJ				
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
75-34-3	1,1-Dichloroethane	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L		4 J	10 J	10 J	1.1 J	1.4 J
78-93-3	2-Butanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.7 J	0.5 U	0.53
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
110-82-7	Cyclohexane	Trace-V	ug/L		0.5 U				
56-23-5	Carbon Tetrachloride	Trace-V	ug/L		0.5 UJ	1.3 J	1.4 J	0.5 U	0.5 U
71-43-2	Benzene	Trace-V	ug/L		0.5 U				
107-06-2	1,2-Dichloroethane	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
108-87-2	Methylcyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.23 J	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L		0.5 U				
75-27-4	Bromodichloromethane	Trace-V	ug/L		0.5 U				
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L		0.5 U				
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L		0.5 U				
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L		0.5 U				
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L		0.5 U				
591-78-6	2-Hexanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
108-93-4	1,2-Dibromoethane	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L		0.5 U				
100-41-4	Ethylbenzene	Trace-V	ug/L		0.5 U				
95-47-6	o-Xylene	Trace-V	ug/L		0.5 U				
179601-23-1	m,p-Xylenes	Trace-V	ug/L		0.5 U				
100-42-5	Styrene	Trace-V	ug/L		0.5 U				
75-25-2	Bromoform	Trace-V	ug/L		0.5 UJ	0.5 UJ	0.5 UJ	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L		0.5 U				
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L		0.5 U				
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L		0.5 U				
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L		0.5 U				
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L		0.5 U				
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L		0.5 U				
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L		0.5 U				
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L		0.5 U				

Old Roosevelt  
Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

Cas Rn	Chemical Name	Analytic Method	Unit \ Depth	Sample Code	GWM-12-6-R4-DUP	GWM-13-1-R4	GWM-13-2-R4	GWM-13-3-R4	GWM-13-4-R4
				Sample Name	GWM-112-6-R4	7/29/2009	7/28/2009	7/28/2009	7/28/2009
<b>(Group Code) (Group Description)</b>									
1-Trace-V	Volatile Organic Compounds								
127-18-4	Tetrachloroethene	Trace-V	ug/L		3.8	13	9.9	60	14
79-01-6	Trichloroethene	Trace-V	ug/L		20	18 J	18	100	30
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U	1	1.2	0.69	0.5 U	
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.51 J	0.5 U	0.65	0.5 U	1.2	
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 UJ	0.61	0.5 U	1.6	0.5 U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 UJ	0.38 J	0.5 U	0.68	0.5 U	
67-64-1	Acetone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.33 J
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L		1 J	0.61	0.66	3.4	1.1
78-93-3	2-Butanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.58	0.5 U	
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.33 J	0.5 U	
110-82-7	Cyclohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.95	0.5 U	
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-87-2	Metylcylohexane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-00-5	1,1;2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L		5 U	5 U	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
108-93-4	1,2-Dibromoethane	Trace-V	ug/L		0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

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Round 4 Groundwater Sampling - Group 2  
Trace Volatile Organic Compounds

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Cas Rn	Chemical Name	Analytic Method	Unit \ Depth	Sample Code	GWM-13-5-R4	GWM-13-6-R4	GWP-10-R4	GWP-11-R4	GWX-10019-R4			
				Sample Name	Sample Date	7/28/2009	7/28/2009	7/30/2009	7/24/2009			
<b>(Group Code) (Group Description)</b>												
<b>1-Trace-V Volatile Organic Compounds</b>												
127-18-4	Tetrachloroethene	Trace-V	ug/L		13	12	150	81	0.5 U			
79-01-6	Trichloroethene	Trace-V	ug/L		29	19	42	60	3.1			
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U	0.5 U	7	3.9 U	0.5 U				
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.93 J	2.2	4.6 J	1.9 J	0.5 U				
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 UJ	0.5 UJ	3	2.3	0.5 U				
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 UJ	0.5 UJ	0.5 U				
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	0.43 J	5 U	5 U				
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U				
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U				
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U				
156-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 U				
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U	0.84			
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 UJ	0.5 U	1.7 J	0.87 J	0.5 U				
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	1.1 J	0.56 J	2	7.9	5.1				
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U				
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U				
67-66-3	Chloroform	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U				
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 UJ	0.5 U	1.5 J	1.3 J	0.5 U				
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U				
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U				
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U				
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U	5 U	5 U				
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 UJ	0.5 U	0.5 U				
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U				
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
100-42-5	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
75-25-2	Bromoform	Trace-V	ug/L	0.5 UJ	0.5 U	0.5 UJ	0.5 UJ	0.5 U				
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
79-34-5	1,1,2,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
98-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.28 J			
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U				

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Trace Volatile Organic Compounds

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWX-10019-R4-DUP	GWX-10020-R4	GWX-8068-R4
			Sample Name	GWX-10019D-R4	7/24/2009	8/3/2009
			Sample Date	7/24/2009	185 to 190 ft	265 to 290 ft
<b>(Group Code) (Group Description)</b>						
<b>1-Trace-V</b>	<b>Volatile Organic Compounds</b>					
127-18-4	Tetrachloroethene	Trace-V	ug/L	0.5 U	0.5 U	420
79-01-6	Trichloroethene	Trace-V	ug/L	2.9	0.5 U	76
75-71-8	Dichlorodifluoromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
74-87-3	Chloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
75-01-4	Vinyl Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
74-83-9	Bromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
75-00-3	Chloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
75-69-4	Trichlorofluoromethane	Trace-V	ug/L	0.5 U	0.5 U	0.95 J
75-35-4	1,1-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	11 J
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	Trace-V	ug/L	0.5 U	0.5 U	3.3 J
67-64-1	Acetone	Trace-V	ug/L	5 U	5 U	5 U
75-15-0	Carbon Disulfide	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
79-20-9	Methyl Acetate	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
75-09-2	Methylene Chloride	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
158-60-5	trans-1,2-Dichloroethene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
1634-04-4	Methyl tert-Butyl Ether	Trace-V	ug/L	0.93	0.5 U	0.5 U
75-34-3	1,1-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.68 J
156-59-2	cis-1,2-Dichloroethene	Trace-V	ug/L	4.8	0.5 U	4 J
78-93-3	2-Butanone	Trace-V	ug/L	5 U	5 U	5 U
74-97-5	Chlorobromomethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
67-66-3	Chloroform	Trace-V	ug/L	0.5 U	0.5 U	2.6 J
71-55-6	1,1,1-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	3.1
110-82-7	Cyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
56-23-5	Carbon Tetrachloride	Trace-V	ug/L	0.5 U	0.5 U	0.45 J
71-43-2	Benzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
107-06-2	1,2-Dichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
108-87-2	Methylcyclohexane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
78-87-5	1,2-Dichloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
75-27-4	Bromodichloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
10061-01-5	cis-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
108-10-1	4-Methyl-2-pentanone	Trace-V	ug/L	5 U	5 U	5 U
108-88-3	Toluene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
10061-02-6	trans-1,3-Dichloropropene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
79-00-5	1,1,2-Trichloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
591-78-6	2-Hexanone	Trace-V	ug/L	5 U	5 U	5 U
124-48-1	Dibromochloromethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
106-93-4	1,2-Dibromoethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
108-90-7	Chlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
100-41-4	Ethylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
95-47-6	o-Xylene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
179601-23-1	m,p-Xylenes	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
100-42-5	Styrene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
75-25-2	Bromoform	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
98-82-8	Isopropylbenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
79-34-5	1,1,2-Tetrachloroethane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
541-73-1	1,3-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
106-46-7	1,4-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
95-50-1	1,2-Dichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
96-12-8	1,2-Dibromo-3-chloropropane	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
120-82-1	1,2,4-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U
87-61-6	1,2,3-Trichlorobenzene	Trace-V	ug/L	0.5 U	0.5 U	0.5 U

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Inorganic Analytes

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-12-2-R4	GWM-12-4-R4	GWM-12-6-R4	GWM-12-6-R4-DUF	GWM-13-2-R4	GWM-13-4-R4	GWM-13-6-R4
			Sample Name	Sample Date	7/29/2009	7/29/2009	7/29/2009	GWM-112-6-R4	7/28/2009	7/28/2009
			Unit \ Depth	485 to 490 ft	355 to 360 ft	245 to 250 ft	245 to 250 ft	485 to 490 ft	355 to 360 ft	245 to 250 ft
<b>(Group Code) (Group Description)</b>										
<b>TAL-Metals-09 Inorganic Analytes</b>										
7440-36-0	Antimony	ILM05.3-MS	UG/L	2 U	2 U	2 U	2 U	2 U	2 U	2 U
7440-38-2	Arsenic	ILM05.3-MS	UG/L	2.8	0.28 J	0.26 J	0.19 J	0.24 J	0.27 J	0.64 J
7440-39-3	Barium	ILM05.3-MS	UG/L	20	17	12.7	12.4	34	21.3	11.9
7440-41-7	Beryllium	ILM05.3-MS	UG/L	1 U	1 U	1 U	1 U	0.025 J	1 U	1 U
7440-43-9	Cadmium	ILM05.3-MS	UG/L	1 U	0.046 J	1 U	1 U	0.064 J	0.41 J	0.063 J
7440-47-3	Chromium	ILM05.3-MS	UG/L	1.4 J	0.75 J	0.82 J	0.7 J	0.74 J	0.79 J	1.5 J
7440-48-4	Cobalt	ILM05.3-MS	UG/L	0.36 J	2.5	1	0.98 J	6.8	4.2	1
7440-50-8	Copper	ILM05.3-MS	UG/L	1.6 J	0.91 J	0.87 J	0.87 J	4.3	1.9 J	2.3
7439-92-1	Lead	ILM05.3-MS	UG/L	0.2 J	0.093 J	0.041 J	0.081 J	0.17 J	0.18 J	0.25 J
7439-96-5	Manganese	ILM05.3-MS	UG/L	18.3 J	20.3 J	17.6 J	17.7 J	64.9 J	29.1 J	33.9 J
7440-02-0	Nickel	ILM05.3-MS	UG/L	9.9	8.9	6.4	3.9 R	9.9	7.7	10.1
7782-49-2	Selenium	ILM05.3-MS	UG/L	0.66 J	1.3 J	1.7 J	1.6 J	1 J	1.7 J	2.4 J
7440-22-4	Silver	ILM05.3-MS	UG/L	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ	1 UJ
7440-28-0	Thallium	ILM05.3-MS	UG/L	0.02 J	0.063 J	0.074 J	0.066 J	0.077 J	0.06 J	0.045 J
7440-62-2	Vanadium	ILM05.3-MS	UG/L	6	0.83 J	0.33 J	0.29 J	0.17 J	0.16 J	0.58 J
7440-66-6	Zinc	ILM05.3-MS	UG/L	27.8 J	54.2 J	15.8 J	14.5 J	84.7 J	35.2 J	405 J

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-05-2-R4	Sample Name	GWM-05-4-R4	Sample Date	GWM-05-7-R4	Sample Name	GWM-09-2-R4	Sample Date	GWM-09-5-R4
7439-89-6	Iron	ILM04-1-M	ug/L	110		540		3700		90		62
7439-89-6	Iron	IRON-DISS	ug/L	50	U	330		760		50	U	50
7439-96-5	Manganese	ILM04-1-M	ug/L	7.1		54		82		290		260
7439-96-5	Manganese	MANGANESE-DISS	ug/L	6.4		56		82		280		260

Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-09-8-R4	Sample Name	GWM-10-2-R4	Sample Date	GWM-10-4-R4	Sample Name	GWM-10-7-R4	Sample Date	GWM-11-1-R4
7439-89-6	Iron	ILM04-1-M	ug/L	120		130		650		53		140
7439-89-6	Iron	IRON-DISS	ug/L	50	U	84		350		73		50
7439-96-5	Manganese	ILM04-1-M	ug/L	220		310		580		30		12
7439-96-5	Manganese	MANGANESE-DISS	ug/L	230		310		640		32		7.5

Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-11-3-R4	Sample Name	GWM-11-3-R4-DUP	Sample Date	GWM-11-6-R4	Sample Name	GWM-12-2-R4	Sample Date	GWM-12-4-R4
7439-89-6	Iron	ILM04-1-M	ug/L	3500		3600		270		73		57
7439-89-6	Iron	IRON-DISS	ug/L	3000		3000		91		50	U	50
7439-96-5	Manganese	ILM04-1-M	ug/L	180		180		180		16		17
7439-96-5	Manganese	MANGANESE-DISS	ug/L	190		190		180		16		16

Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-12-6-R4	Sample Name	GWM-13-2-R4	Sample Date	GWM-13-4-R4	Sample Name	GWM-13-6-R4	Sample Date	GWX-10019-R4
7439-89-6	Iron	ILM04-1-M	ug/L	95		50		55		250		9800
7439-89-6	Iron	IRON-DISS	ug/L	50	U	50	U	50		160		50
7439-96-5	Manganese	ILM04-1-M	ug/L	18		57		30		12		120
7439-96-5	Manganese	MANGANESE-DISS	ug/L	17		58		25		7.3		29

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Wet Chemistry

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Cas Rn	Chemical Name	Analytic Method	Sample Code	GWM-12-4-R4	GWM-12-6-R4	GWM-13-2-R4	GWM-13-4-R4	GWM-13-6-R4			
			Sample Name	Sample Date	Unit \ Depth	7/29/2009 355 to 360 ft	7/29/2009 245 to 250 ft	7/28/2009 485 to 490 ft			
<b>(Group Code) (Group Description)</b>											
TDS-TSS-TKN	Wet Chemistry										
TKN	Nitrogen, Total Kjeldahl	MCAWW351-	mg/L	0.1	U	0.1	U	0.1	U	0.17	
TDS	Total Dissolved Solids	MCAWW160-1	mg/L	110		130		190		140	150
TSS	Total Suspended Solids	MCAWW160-2	mg/L	4	U	4	U	8	U	4	4
NH3	Nitrogen, Ammonia	MCAWW350-1	mg/L	0.05	U	0.05	U	0.05	U	0.05	0.076
CACOA-H	Hardness As CaCO3	MCAWW130-1	mg/L	27		23		38		31	34

# Appendix I

**Appendix I**

**Round 4 Data Usability Report**

# Data Quality Assessment Summary

CDM Federal Programs Corporation (CDM) performed pre-remedial design activities under EPA RAC 2 Contract Number EP-W-09-002, Work Assignment Number 008-RDRD-02PE, to support the remedial design for the Old Roosevelt Field Contaminated Groundwater Site, in Garden City, New York (the Site). Pre-remedial design samples were collected July 22nd through August 4th, 2009.

The purpose of this assessment is to evaluate the usability of the data collected and to determine whether they meet the quality objectives and user requirements outlined in the CDM Final Quality Assurance Project Plan (QAPP), Remedial Design, Old Roosevelt Field Contaminated Groundwater Site, Garden City, New York, March 14, 2008 (Final QAPP) (CDM 2008) and the Final QAPP Addendum, Remedial Design, Old Roosevelt Field, February 19, 2009 (CDM 2009).

## D.1 Usability Summary

A total of 138 water samples were sent to an Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) laboratory for trace level VOC analysis. A subset of these samples was sent to another CLP laboratory for target analyte list (TAL) metals analysis and to the Division of Environmental Science and Assessment (DESA) laboratory for wet chemistry analysis. The data generated by these fixed-base laboratories comprise the definitive data set. All procedures outlined in the Final QAPPs were followed except for the deviations documented by the two field change requests (FCRs) generated for this round of data. These are summarized under section D.3 of this report. None of the field deviations adversely affect the data usability.

The EPA performed data validation of the VOC and metal data and DESA performed data validation of the wet chemistry data. Some data were qualified due to quality control (QC) criteria outliers. Qualified data is presented in an Appendix to the Supplemental Pre-remedial Design Investigation Technical Memorandum. Data that did not meet QC criteria were qualified during data validation as estimated "J" and are usable; as rejected "R" and are not usable; or non-detect "U", as appropriate.

Definitive data was generated during the pre-remedial design investigation from sample locations at or near the Site. Seven VOC results in sample GWM-11-3-R4 (1,2-dibromo-3-chloropropane, 1,4-dichlorobenzene, 1,2-dichlorobenzene, bromoform, 1,3-dichlorobenzene, 1,2,4-trichlorobenzene, and 1,2,3-trichlorobenzene) were rejected due to low internal standard area counts. The nickel field duplicate result for this sample was also rejected due to failure of the field duplicate validation criteria (absolute difference greater than twice the contract required quantitation limit). The original sample's nickel result was not qualified. This rejected data is not usable for the objectives described in section D.2.

The rejected data represents 0.1 percent of the VOC data and 0.65 percent of the metals data and does not include any of the contaminants of concern for this site. All other data results reported herein are usable as reported. The impact on data quality is further discussed under the Completeness section of this report, D.5.5.

## D.2 Project Objectives

The specific purpose of this sampling event of the pre-remedial design investigation was to conduct one round of groundwater sampling:

- # To refine the horizontal and vertical boundaries of the VOC plume in order to proceed with design of the groundwater remedy
- # To assist in placement of well screen locations
- # To determine if additional wells are needed
- # To confirm levels of contamination that need to be treated
- # To update groundwater model

All data was collected, analyzed, and validated/evaluated in order to meet data quality objectives (DQOs) that were established during project planning to generate data of sufficient quality and to achieve the project objective. Measurement criteria were also established for the data quality indicators (DQIs), precision, accuracy, representativeness, comparability, and completeness. These DQIs provide a mechanism for on-going control and a means of evaluating and measuring data quality throughout the project. The DQIs are outlined on worksheets #12 and 28 of the Final QAPPs.

## D.3 Summary of Pre-Remedial Design Investigation Activities

CDM completed sampling activities in accordance with the EPA approved Final QAPPs. Samples were collected and shipped to the EPA CLP laboratories and DESA. The Final QAPPs defined the procedures to be followed and the data quality requirements for the field program. Table 1 summarizes the data collected, analytical methods, and laboratories used.

The following FCRs were implemented during the field program as changes to the Final QAPPs:

- \$ FCR-6 dated June 10, 2009 involved using a smaller sand size to mix with the Bentonite slurry used for well installation. Use of the smaller sand size (#1 and #100) instead of the #3 sand allowed better mixing and more uniform distribution of the sand in the slurry and created a better seal.
- \$ FCR-7 dated June 17, 2009 changed the well development method for SVP-12 and SVP-13. The change from packer/pump method to an air-lift/swab method provided more thorough removal of drilling mud and fine particles.

These FCRs do not affect usability of the data. They provided techniques which allowed for collection of more representative samples.

Matrix spike and laboratory duplicates (MS/Ds), field duplicates, and field QC samples were collected at the frequency described in the Final QAPP to assess the quality of the field data. MS/Ds were collected at a minimum frequency of 5 percent (1 out of every 20 samples) for the TAL metals and wet chemistry analyses. Field

blanks were associated with each day of sample collection for well monitoring sampling. Trip blanks were submitted with each cooler containing water samples for volatile organic compound (VOC) analysis.

Samples were given a CDM identification (ID) number. For the CLP VOC analysis, the samples were submitted using a unique CLP sample number. The field duplicate samples were given different CLP numbers than the original samples. After analytical results were received from the laboratory, samples were renamed to the CDM identification number and the duplicates were given the same identification as the original sample with "DUP" added to identify the sample as a duplicate.

## D.4 Field Quality Assurance/ Quality Control (QA/QC)

Field quality assurance/quality control (QA/QC) objectives were accomplished through the use of appropriate sampling techniques and collection of field duplicates and field blanks. Analytical QA/QC was assessed by internal QC checks, method blanks, surrogate spikes, sample custody tracking, sample preservation, adherence to holding times; laboratory control samples (LCSs) and MS/Ds.

### D.4.1 Methods

Samples were analyzed using the methods shown on Table 1.

The CLP generated data were validated by EPA according to EPA Region 2 methodology for trace VOCs, standard operating procedure (SOP) HW-34, and target analyte list (TAL) metals, SOP HW-2.

DESA analyzed and validated the wet chemistry data they generated using their own validation SOPs.

## D.5 Data Quality Indicators

Precision, accuracy, representativeness, comparability, and completeness are used as indicators of data quality and are named DQIs. These DQIs provide a mechanism for evaluating and measuring data quality throughout the project. Achievement of the project's quality objectives were measured from the DQI results assessed against their measurement performance criteria. Worksheets #12 and 28 of the Final QAPP outline the measurement performance criteria. These criteria are defined and their results discussed in the appropriate sections below.

### D.5.1 Accuracy

Accuracy is a measurement of agreement for a given measurement against an accepted reference value. It is typically assessed through the analysis of matrix spike and calibration check samples, and expressed as a percent recovery.

Accuracy for the entire data collection activity is difficult to assess because several sources of error exist. Errors can be introduced by any of the following:

- # Sampling procedure
- # Field contamination
- # Sample preservation and handling

- # Sample matrix
- # Sample preparation
- # Analytical techniques

Accuracy for sampling was maximized through strict adherence to field sampling SOPs, the approved Final QAPPs and the use of EPA approved methods for sample analyses. By following approved procedures, sampling events should provide results that are representative of environmental conditions at the time of sampling. No deviations from these procedures were noted.

**Holding Time and Sample Receipt** - The analytical holding times were met for all data groups, therefore no impact on the reported data occurred.

**Spike Recoveries** - EPA and DESA validators reviewed the organic, inorganic and wet chemistry matrix spike, and laboratory control sample (LCS) results as applicable. Recoveries were within their QC criteria except for antimony for which all results were qualified as estimated.

**Surrogate Recoveries** - Several surrogates and deuterated monitoring compounds (DMCs) exceeded QC criteria. This affected many VOC results which were qualified as estimated "J" or "UJ" by the data validator.

**Calibration Recoveries** - Metal calibration standards and organic instrument calibration and calibration checks were performed in accordance with applicable analytical methods. Metal calibration recovery results met criteria. Outlying VOC continuing calibration standard recoveries resulted in estimation of a total of 23 hits or non-detect results. Affected were TCE results in 7 samples; 4-Methyl-2-pentanone, 2-hexanone and trichlorofluoromethane in 2 samples; and carbon tetrachloride in 2 samples, bromomethane in 6 samples, and trans 1,3-dichloropropene in 2 samples.

**Internal Standards** - All internal standards results were inside the acceptable retention time windows but several areas were outside the desired window resulting in 39 estimated VOC data points.

**Interference Checks** - Manganese failed the interference check test requiring estimation of nine sample results.

### D.5.2 Precision

Precision is a quantitative term that estimates the reproducibility of a set of replicate measurements under a given set of conditions. It is defined as a measurement of mutual agreement between measurements of the same property, and is expressed in terms of relative percent difference (RPD) between duplicate determinations.

RPD is calculated as follows:

$$\text{RPD} = \text{absolute value } [(C_1 - C_2) / \{(C_1 + C_2) / 2\}] \times 100$$

Where:  $C_1$  = Concentration of sample #1

C2 = Concentration of sample #2

Field duplicate samples were collected in the same manner as the original samples but were collected in separate containers, given separate sample identifiers and treated as unique samples by the laboratory.

Tables 2a and 2b show the field duplicate results. RPDs were not calculated when both values were not detected. The absolute difference was calculated when results failed the RPD or where one result was non-detect or results fell below five times the reporting limit. An RPD of less than or equal to 50 percent or absolute difference less than five times the reporting limit indicates good precision for field duplicate water samples (as per Final QAPP, CDM 2008 and 2009).

Analytical precision was based on the analytical requirements. Outliers are described in the data validation reports and summarized below.

**Analytical Data Precision**

The analytical precision for the reported data was determined by review of MS/D, laboratory duplicate and serial dilution test results. The MS/D and laboratory duplicate met the requirements. The serial dilution tests yielded percent differences greater than the criteria resulting in estimation of antimony in one sample and zinc in all nine samples.

**Field Data Precision**

The field duplicates indicate that the QAPP field precision criteria were fully met. Therefore no adverse impacts to the usability of the data were noted. However, one nickel field duplicate sample result was rejected by the data validator because the absolute difference was above two times the CRQL.

The RPDs between the following samples and their duplicate results, (GWM-04-5-R4, GWM-10-5-R4, GWM-11-3-R4, GWM-12-1-R4 and GWM-12-6-R4 for VOCs, GWM-12-6-R4 for metals, and GWM-11-3-R4 for wet chemistry) met the QAPP precision criteria.

**D.5.3 Blank Contamination**

Table 3 shows the contaminants detected in the field rinsate blanks (field blanks) and trip blanks. Field blanks are used to evaluate the presence of contaminants on sampling equipment following decontamination and the potential for cross contamination during sample collection. Trip blanks are used to detect cross-contamination of VOCs during shipment. Laboratory method blanks are analyzed to indicate possible contamination introduced by sample handling, preparation, and/or analysis at the laboratory.

Contaminants were detected at similar levels in the trip and field blanks as discussed below.

**Field Blanks**

TCL Trace VOCs were analyzed for each of the water samples collected.

Chloroform was detected in two of the ten field rinsate blanks (0.78 and 0.63 µg/L) just above the CRQL. Methylene chloride and toluene were detected (0.35 µg/L and 0.23 µg/L, respectively) in one field rinsate blank below the CRQL (Table 3). Qualification of the data is discussed in the trip blank section below.

Only one zinc result was impacted by the field rinsate blanks. One sample required estimation. Other TAL metals blank results were able to achieve CRQLs.

#### **Trip Blanks**

VOC concentrations were below the CRQL in the trip blanks with three exceptions. Levels of detection were similar to those in the field blanks. Chloroform (0.89 µg/L) and methylene chloride (0.25 and 0.38 µg/L) were detected in one and two blanks respectively.

The data validators did not require qualification of any of the associated data either because they were not associated with the contaminated blank or the concentration was determined to be outside the range for blank qualification.

#### **Laboratory Blanks**

Method and storage blank detections required sample result qualification as non-detect "U" in a few samples. Methylene chloride, and/or toluene were found in the two storage blanks; and methylene chloride was detected in three method blanks requiring qualification as non-detect "U" in a few associated samples.

Antimony required "U" qualification in one sample due to calibration blank outlier.

### **D.5.4 Representativeness and Comparability**

Representativeness and comparability are achieved by using EPA approved sampling procedures and analytical methodologies. By following the approved Final QAPPs procedures for sample collection, sampling events should yield results representative of environmental conditions at the time of sampling. Similarly, reasonable comparability of analytical results should have been achieved since the approved EPA analytical methods and standardized reporting units were employed.

#### **D.5.4.1 Representativeness**

Representativeness is a qualitative term that expresses the degree to which the sample data accurately and precisely represent the environmental conditions corresponding to the location and depth interval of sample collection. The sampling scheme, requirements and procedures for sampling were designed to maximize sample representativeness. Representativeness also can be monitored by reviewing field documentation and by performing field audits. Appropriate laboratory QA/QC requirements were described in the Final QAPP and laboratory statements of work (SOWs) to ensure that the laboratory analytical results were representative of true field conditions.

Sample representativeness was achieved by CDM through the use of EPA analytical methods, decontaminated sampling equipment, the use of inert materials to collect samples, clean sample gloves, and standard sampling procedures for EPA Region 2.

Samples were kept at 4°C and received intact at the laboratories. The generally low concentrations of blank contaminants as discussed above are an indication that sample results are representative of the site conditions.

#### D.5.4.2 Comparability

Comparability is a qualitative term that expresses the confidence with which a data set can be compared with another. Strict adherence to standard sample collection procedures, analytical detection limits, and analytical methods assures that data from like samples and sample conditions are comparable. This comparability is independent of laboratory personnel, data reviewers, or sampling personnel. Comparability criteria are met for the project if, based on data review, the sample collection and analytical procedures are determined to have been followed or that variations in procedures did not affect the values reported.

To ensure comparability of data generated for the site, standard sample collection procedures and EPA-approved analytical methods were utilized by CDM. The sample analyses were performed by EPA and DESA using defined, standard methods. Utilizing such procedures and methods enables the current data to be comparable with the previous data sets generated with similar methods. All aqueous samples were reported in µg/L or milligrams per liter (mg/L).

Detection limits were generally low enough to compare the data with the site specific groundwater criteria except for the compounds listed on Table 4. Four VOC compounds have reported quantitation limits above the listed site specific groundwater criteria but within the project action limits (PALs) and quantitation limit goals developed in the March 2008 QAPP. The PALs were derived from EPA and New York drinking water and groundwater criteria as detailed on QAPP worksheet #15. These PALs and quantitation limit goals listed in the QAPP were for the purpose of ensuring that contaminants of interest meet the lowest available method reporting limits. For groundwater samples, cis- and trans-1,3-dichloropropene, 1,2-dibromoethane and 1,2-dibromo-3-chloropropane were reported to limits within the PALs listed in the Final QAPP but above the limits currently being used to evaluate the data. One objective of the pre-remedial design investigation activities was to re-evaluate the VOC plume onsite. This objective was accomplished by focusing on groundwater contaminant concentrations of site-related contaminants, primarily tetrachloroethene, trichloroethene, 1,1-dichlorethane, cis-1,2-dichloroethene, and carbon tetrachloride (as stated in the CDM Technical Memorandum 2009). The four VOCs reported to limits above the groundwater criteria were not contaminants of concern for re-evaluating plume boundaries. All other detection limits were at or below the PAL and current groundwater criteria to allow characterization of plume boundaries. The data user is cautioned however to re-evaluate the sample reporting limits against the final approved Remedial Design criteria and any other criteria established for use of the data.

### D.5.5 Data Completeness

Completeness of the field program is defined as the percentage of samples planned for collection as listed in the Final QAPP versus the actual samples collected during the field program (See equation A).

Completeness for acceptable data is defined as the percentage of acceptable data obtained judged to be valid versus the total quantity of data generated (See equation B). Acceptable data includes both data that pass all the QC criteria (unqualified data) and data that may not pass all the QC criteria but had appropriate corrective actions taken (qualified but usable data).

$$A. \quad \% \text{ Completeness} = C \times \frac{100}{n}$$

where,

C = actual number of samples collected  
n = total number of samples planned

$$B. \quad \% \text{ Completeness} = V \times \frac{100}{n'}$$

where,

V = number of measurements judged valid  
n' = total number of measurements made

Completeness of the data set achieved by CDM is presented in Table 5. The list of samples collected and parameters analyzed are shown on Table 1 of this assessment. The overall goal was to generate a complete data set for at least 90 percent of the samples planned for collection and 90 percent valid data from the samples analyzed.

The data validation narratives indicate that the sample analyses generally met the QC criteria cited in the methods with the exceptions noted in the data narratives. Results associated with QC outliers were appropriately qualified as estimated or as non-detect by data validators. Approximately four percent of the VOC analyses were estimated due to exceedance of surrogate, internal standard or calibration criteria. These estimated data are usable for the intended project purposes.

Ninety-nine percent of the data collected was judged usable. This met the objective of 90 percent usable data.

All (100) percent of the planned samples were collected. This met the objective of 90 percent data collection.

### D.6 Assessment of Data Usability and Reconciliation with QAPP Goals

Sample results evaluated in this assessment will be used for the objectives stated in Section D.2 of this report.

Data quality objective (DQO) goals for completeness, comparability, and representativeness established during project planning were mainly achieved. Data failing quality control (QC) criteria were appropriately qualified as estimated, rejected or non-detect during data validation. All data reported herein are usable as reported with the data validation qualifiers added except for rejected data.

Less than one percent of the VOC data collected were rejected due to exceedance of internal standards criteria. One sample was impacted by this failure, GWM-11-3-R4, but none of the rejected compounds were contaminants of concern. Ninety-nine percent of the Round 4 groundwater data are suitable for their intended use as stated earlier. The rejected data should not be used for project decisions.

The Round 4 Pre-Remedial Design Investigation data are suitable for their intended use as stated above and in the Final QAPPs. The data quality goals from the QAPPs have been met.

## **D.7 Data Validation Qualifiers**

The following qualifiers are used with the reported data.

### **Qualifiers:**

- U** - Compound was analyzed for but not detected. The associated numerical value is the sample quantitation.
- J** - Estimated data due to exceeded quality control criteria.
- UJ** - Estimated non-detect data due to exceeded quality control criteria.
- R** - Rejected unusable data. Data is known to contain significant errors based on documented information and must not be used by the data user.

## D.8 Acronyms

ABS	absolute difference
CDM	CDM Federal Programs Corporation
CLP	Contract Laboratory Program
CRQL	contact required quantitation limit
D	duplicate
DESA	Division of Environmental Science and Assessment
DMC	deuterated monitoring compound
DQA	data quality assessment
DQI	data quality indicator
DQO	data quality objective
DV	data validation
EPA	(United States) Environmental Protection Agency
FCR	field change request
ICP-MS	inductively coupled plasma-mass spectroscopy
ID	identification
L	liter
LCS	laboratory control sample
MDL	method detection limit
mg	milligram
µg	microgram
MS	matrix spike
D	laboratory duplicate
NA	not applicable
NC	not calculable
NR	not reported
PAL	project action limit
QA/QC	quality assurance/quality control
QAPP	quality assurance project plan
RI	remedial investigation
RPD	relative percent difference
SOP	standard operating procedure
SOW	statement of work
SVOC	semi volatile organic compound
TAL	target analyte list
TCL	target compound list
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TOC	total organic carbon
TSS	total suspended solids
VOC	volatile organic compound
%R	percent recovery

## D.9 References

- CDM Federal Programs Corporation (CDM). 2008. Final Quality Assurance Project Plan for Groundwater Remediation at the Puchack Well Field Superfund Site, Pennsauken Township, New Jersey. February
- \_\_\_\_\_. 2009. Final QAPP Addendum, Remedial Design, Old Roosevelt Field, February 19.

### Data Validation Procedures (EPA Region 2 protocols)

Environmental Protection Agency. 2007. Region II Standard Operating Procedures (SOP) No. HW-6. Revision 34, Revision 1 - Data Validation SOP for Organic Analysis of Trace Concentration VOCs under SOW SOM01.1. August.

\_\_\_\_\_. Division of Environmental Science and Assessment. Quality Management Plan, Standard Operating Procedure, SOP G-25.

### Analytical Methodologies

EPA. 2007. Multi-media, Multi-Concentration, Organic Analytical Service for Superfund. SOM01.2. June.

EPA. 2007. Multi-media, Multi-Concentration, Inorganic Analysis Service for Superfund. Document No. ILM05.4. March.

EPA-600/4-79-020. 1983 Revision. Methods for the Chemical Analysis of Water and Wastes (EPA). March.

Standard Methods for the Examination of Water and Wastewater. 19th Edition.

**Table 1**

**Sample Summary**

Table 1

**Data Usability - Pre-Remedial Design Investigation  
Sample Summary - Round 4  
Old Roosevelt Field Contaminated Groundwater Site  
Garden City, New York**

Sample Name	Date	Sample Location	Case No.	CLP ID.	Comment	QC Information/ Field Duplicate Parent	Analytical Data									
							Total Fe & Mn	Total Metals-MS	Dissolved Fe	Dissolved Mn	HARDNESS	TDS	TSS	NH3	TKN	Trace-VOCs
FB080409	8/4/09		38818	B59B2	Round 4 GW 2009		2	1	1							51
GWM-07-1-R4	8/4/09	SVP/GWM-7	38818	B5929	Round 4 GW 2009											51
GWM-07-2-R4	8/4/09	SVP/GWM-7	38818	B5930	Round 4 GW 2009											51
GWM-07-3-R4	8/4/09	SVP/GWM-7	38818	B5931	Round 4 GW 2009											51
GWM-07-4-R4	8/4/09	SVP/GWM-7	38818	B5932	Round 4 GW 2009											51
GWM-07-5-R4	8/4/09	SVP/GWM-7	38818	B5933	Round 4 GW 2009											51
GWM-07-6-R4	8/4/09	SVP/GWM-7	38818	B5934	Round 4 GW 2009											51
GWM-10-10-R4	8/4/09	SVP/GWM-10	38818	B5951	Round 4 GW 2009											51
GWM-10-6-R4	8/4/09	SVP/GWM-10	38818	B5957	Round 4 GW 2009											51
GWM-10-7-R4	8/4/09	SVP/GWM-10	38818	B5958	Round 4 GW 2009	Matrix Spike	2	1	1							51
GWM-10-8-R4	8/4/09	SVP/GWM-10	38818	B5959	Round 4 GW 2009											51
GWM-10-9-R4	8/4/09	SVP/GWM-10	38818	B5960	Round 4 GW 2009											51
TB080409	8/4/09		38818	B59A1	Round 4 GW 2009											51
FB080309	8/3/09		38818	B59B1	Round 4 GW 2009		2	1	1							51
GWM-10-1-R4	8/3/09	SVP/GWM-10	38818	B5952	Round 4 GW 2009											51
GWM-10-2-R4	8/3/09	SVP/GWM-10	38818	B5953	Round 4 GW 2009		2	1	1							51
GWM-10-3-R4	8/3/09	SVP/GWM-10	38818	B5954	Round 4 GW 2009											51
GWM-10-4-R4	8/3/09	SVP/GWM-10	38818	B5955	Round 4 GW 2009		2	1	1							51
GWM-10-5-R4	8/3/09	SVP/GWM-10	38818	B5956	Round 4 GW 2009											51
GWM-10-5-R4-DUP	8/3/09	SVP/GWM-10	38818	B5961	Round 4 GW 2009	GWM-110-5-R4										51
GWX-8068-R4	8/3/09	GWX-8068	38818	B59A2	Round 4 GW 2009											51
TB080309	8/3/09		38818	B59A0	Round 4 GW 2009											51
FB073109	7/31/09		38818	B59B0	Round 4 GW 2009											51
GWM-08-1-R4	7/31/09	SVP/GWM-8	38818	B5935	Round 4 GW 2009											51
GWM-08-2-R4	7/31/09	SVP/GWM-8	38818	B5936	Round 4 GW 2009											51
GWM-08-3-R4	7/31/09	SVP/GWM-8	38818	B5937	Round 4 GW 2009											51
GWM-08-4-R4	7/31/09	SVP/GWM-8	38818	B5938	Round 4 GW 2009											51
GWM-08-5-R4	7/31/09	SVP/GWM-8	38818	B5939	Round 4 GW 2009											51
GWM-08-6-R4	7/31/09	SVP/GWM-8	38818	B5940	Round 4 GW 2009											51
TB073109	7/31/09		38818	B5999	Round 4 GW 2009											51
FB073009	7/30/09		38818	B59A9	Round 4 GW 2009		2	1	1							51
GWM-11-1-R4	7/30/09	SVP/GWM-11	38818	B5963	Round 4 GW 2009		2	1	1	1	1	1	1	1	1	51
GWM-11-10-R4	7/30/09	SVP/GWM-11	38818	B5962	Round 4 GW 2009											51
GWM-11-2-R4	7/30/09	SVP/GWM-11	38818	B5964	Round 4 GW 2009											51
GWM-11-3-R4	7/30/09	SVP/GWM-11	38818	B5965	Round 4 GW 2009		2	1	1	1	1	1	1	1	1	51
GWM-11-3-R4-DUP	7/30/09	SVP/GWM-11	38818	B5972	Round 4 GW 2009	GWM-111-3-R4	2	1	1	1	1	1	1	1	1	51
GWM-11-4-R4	7/30/09	SVP/GWM-11	38818	B5966	Round 4 GW 2009											51

Table 1

**Data Usability - Pre-Remedial Design Investigation**  
**Sample Summary - Round 4**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Sample Name	Date	Sample Location	Case No.	CLP ID.	Comment	QC Information/ Field Duplicate Parent	Analytical Data									
							Total Fe & Mn	Total Metals-MS	Dissolved Fe	Dissolved Mn	HARDNESS	TDS	TSS	NH3	TKN	Trace-VOCs
GWM-11-5-R4	7/30/09	SVP/GWM-11	38818	B5967	Round 4 GW 2009											51
GWM-11-6-R4	7/30/09	SVP/GWM-11	38818	B5968	Round 4 GW 2009		2	1	1	1	1	1	1	1		51
GWM-11-7-R4	7/30/09	SVP/GWM-11	38818	B5969	Round 4 GW 2009											51
GWM-11-8-R4	7/30/09	SVP/GWM-11	38818	B5970	Round 4 GW 2009											51
GWM-11-9-R4	7/30/09	SVP/GWM-11	38818	B5971	Round 4 GW 2009											51
GWP-10-R4	7/30/09	GWP-10	38818	B5987	Round 4 GW 2009											51
GWP-11-R4	7/30/09	GWP-11	38818	B5988	Round 4 GW 2009											51
TB073009	7/30/09		38818	B5998	Round 4 GW 2009											51
FB072909	7/29/09		38818	B59A8	Round 4 GW 2009		2	16	1	1						51
GWM-12-1-R4	7/29/09	SVP/GWM-12	38818	B5975	Round 4 GW 2009											51
GWM-12-1-R4-DUP	7/29/09	SVP/GWM-12	38818	B5973	Round 4 GW 2009	GWM-112-1-R4										51
GWM-12-2-R4	7/29/09	SVP/GWM-12	38818	B5976	Round 4 GW 2009		2	16	1	1	1	1	1	1	1	51
GWM-12-3-R4	7/29/09	SVP/GWM-12	38818	B5977	Round 4 GW 2009											51
GWM-12-4-R4	7/29/09	SVP/GWM-12	38818	B5978	Round 4 GW 2009		2	16	1	1	1	1	1	1	1	51
GWM-12-5-R4	7/29/09	SVP/GWM-12	38818	B5979	Round 4 GW 2009											51
GWM-12-6-R4	7/29/09	SVP/GWM-12	38818	B5980	Round 4 GW 2009		2	16	1	1	1	1	1	1	1	51
GWM-12-6-R4-DUP	7/29/09	SVP/GWM-12	38818	B5974	Round 4 GW 2009	GWM-112-6-R4		16								51
TB072909	7/29/09		38818	B5997	Round 4 GW 2009											51
FB072809	7/28/09		38818	B59A7	Round 4 GW 2009		2	16	1	1						51
GWM-13-1-R4	7/28/09	SVP/GWM-13	38818	B5981	Round 4 GW 2009											51
GWM-13-2-R4	7/28/09	SVP/GWM-13	38818	B5982	Round 4 GW 2009		2	16	1	1	1	1	1	1	1	51
GWM-13-3-R4	7/28/09	SVP/GWM-13	38818	B5983	Round 4 GW 2009											51
GWM-13-4-R4	7/28/09	SVP/GWM-13	38818	B5984	Round 4 GW 2009		2	16	1	1	1	1	1	1	1	51
GWM-13-5-R4	7/28/09	SVP/GWM-13	38818	B5985	Round 4 GW 2009											51
GWM-13-6-R4	7/28/09	SVP/GWM-13	38818	B5986	Round 4 GW 2009	Matrix Spike	2	16	1	1	1	1	1	1	1	51
TB072809	7/28/09		38818	B5996	Round 4 GW 2009											51
FB072709	7/27/09		38818	B59A6	Round 4 GW 2009		2		1	1						51
GWM-02-4-R4R	7/27/09	SVP/GWM-2	38818	B5984	Round 4 GW 2009											51
GWM-09-1-R4	7/27/09	SVP/GWM-9	38818	B5942	Round 4 GW 2009											51
GWM-09-10-R4	7/27/09	SVP/GWM-9	38818	B5941	Round 4 GW 2009											51
GWM-09-2-R4	7/27/09	SVP/GWM-9	38818	B5943	Round 4 GW 2009		2		1	1						51
GWM-09-3-R4	7/27/09	SVP/GWM-9	38818	B5944	Round 4 GW 2009											51
GWM-09-4-R4	7/27/09	SVP/GWM-9	38818	B5945	Round 4 GW 2009											51
GWM-09-5-R4	7/27/09	SVP/GWM-9	38818	B5946	Round 4 GW 2009		2		1	1						51
GWM-09-6-R4	7/27/09	SVP/GWM-9	38818	B5947	Round 4 GW 2009											51
GWM-09-7-R4	7/27/09	SVP/GWM-9	38818	B5948	Round 4 GW 2009											51
GWM-09-8-R4	7/27/09	SVP/GWM-9	38818	B5949	Round 4 GW 2009	Matrix Spike	2		1	1						51

Table 1

**Data Usability - Pre-Remedial Design Investigation  
Sample Summary - Round 4  
Old Roosevelt Field Contaminated Groundwater Site  
Garden City, New York**

Sample Name	Date	Sample Location	Case No.	CLP ID.	Comment	QC Information/ Field Duplicate Parent	Analytical Data								
							Total Fe & Mn	Total Metals-MS	Dissolved Fe	Dissolved Mn	HARDNESS	TDS	TSS	NH3	TKN
GWM-09-9-R4	7/27/09	SVP/GWM-9	38818	B5950	Round 4 GW 2009										51
TB072709	7/27/09		38818	B5995	Round 4 GW 2009										51
FB072409	7/24/09		38818	B59A5	Round 4 GW 2009		2	1	1						51
GWM-05-1-R4	7/24/09	SVP/GWM-5	38818	B5914	Round 4 GW 2009										51
GWM-05-10-R4	7/24/09	SVP/GWM-5	38818	B5913	Round 4 GW 2009										51
GWM-05-2-R4	7/24/09	SVP/GWM-5	38818	B5915	Round 4 GW 2009		2	1	1						51
GWM-05-3-R4	7/24/09	SVP/GWM-5	38818	B5916	Round 4 GW 2009										51
GWM-05-4-R4	7/24/09	SVP/GWM-5	38818	B5917	Round 4 GW 2009		2	1	1						51
GWM-05-5-R4	7/24/09	SVP/GWM-5	38818	B5918	Round 4 GW 2009										51
GWM-05-6-R4	7/24/09	SVP/GWM-5	38818	B5919	Round 4 GW 2009										51
GWM-05-7-R4	7/24/09	SVP/GWM-5	38818	B5920	Round 4 GW 2009		2	1	1						51
GWM-05-8-R4	7/24/09	SVP/GWM-5	38818	B5921	Round 4 GW 2009										51
GWM-05-9-R4	7/24/09	SVP/GWM-5	38818	B5922	Round 4 GW 2009										51
GWX-10019-R4	7/24/09	GWX-10019	38818	B5990	Round 4 GW 2009		2	1	1						51
GWX-10019-R4-DUP	7/24/09	GWX-10019	38818	B5989	Round 4 GW 2009	GWX-10019D-R4									51
GWX-10020-R4	7/24/09	GWX-10020	38818	B5991	Round 4 GW 2009										51
TB072409	7/24/09		38818	B5994	Round 4 GW 2009										51
FB072309	7/23/09		38818	B59A4	Round 4 GW 2009										51
GWM-03-1-R4	7/23/09	SVP/GWM-3	38818	B58Z5	Round 4 GW 2009										51
GWM-03-2-R4	7/23/09	SVP/GWM-3	38818	B58Z6	Round 4 GW 2009										51
GWM-03-3-R4	7/23/09	SVP/GWM-3	38818	B58Z7	Round 4 GW 2009										51
GWM-03-4-R4	7/23/09	SVP/GWM-3	38818	B58Z8	Round 4 GW 2009										51
GWM-03-5-R4	7/23/09	SVP/GWM-3	38818	B58Z9	Round 4 GW 2009										51
GWM-03-6-R4	7/23/09	SVP/GWM-3	38818	B5900	Round 4 GW 2009										51
GWM-03-7-R4	7/23/09	SVP/GWM-3	38818	B5901	Round 4 GW 2009										51
GWM-04-1-R4	7/23/09	SVP/GWM-4	38818	B5903	Round 4 GW 2009										51
GWM-04-10-R4	7/23/09	SVP/GWM-4	38818	B5902	Round 4 GW 2009										51
GWM-04-2-R4	7/23/09	SVP/GWM-4	38818	B5904	Round 4 GW 2009										51
GWM-04-3-R4	7/23/09	SVP/GWM-4	38818	B5905	Round 4 GW 2009										51
GWM-04-4-R4	7/23/09	SVP/GWM-4	38818	B5906	Round 4 GW 2009										51
GWM-04-5-R4	7/23/09	SVP/GWM-4	38818	B5907	Round 4 GW 2009										51
GWM-04-5-R4-DUP	7/23/09	SVP/GWM-4	38818	B5912	Round 4 GW 2009	GWM-104-5-R4									51
GWM-04-6-R4	7/23/09	SVP/GWM-4	38818	B5908	Round 4 GW 2009										51
GWM-04-7-R4	7/23/09	SVP/GWM-4	38818	B5909	Round 4 GW 2009										51
GWM-04-8-R4	7/23/09	SVP/GWM-4	38818	B5910	Round 4 GW 2009										51
GWM-04-9-R4	7/23/09	SVP/GWM-4	38818	B5911	Round 4 GW 2009										51
GWM-06-1-R4	7/23/09	SVP/GWM-6	38818	B5923	Round 4 GW 2009										51

Table 1

**Data Usability - Pre-Remedial Design Investigation  
Sample Summary - Round 4  
Old Roosevelt Field Contaminated Groundwater Site  
Garden City, New York**

Sample Name	Date	Sample Location	Case No.	CLP ID.	Comment	QC Information/ Field Duplicate Parent	Analytical Groups										
							Total Fe & Mn	Total Metals-MS	Dissolved Fe	Dissolved Mn	HARDNESS	TDS	TSS	NH3	TKN	Trace-VOCs	
GWM-06-2-R4	7/23/09	SVP/GWM-6	38818	B5924	Round 4 GW 2009											51	
GWM-06-3-R4	7/23/09	SVP/GWM-6	38818	B5925	Round 4 GW 2009											51	
GWM-06-4-R4	7/23/09	SVP/GWM-6	38818	B5926	Round 4 GW 2009											51	
GWM-06-5-R4	7/23/09	SVP/GWM-6	38818	B5927	Round 4 GW 2009											51	
GWM-06-6-R4	7/23/09	SVP/GWM-6	38818	B5928	Round 4 GW 2009											51	
TB072309	7/23/09		38818	B5993	Round 4 GW 2009											51	
FB072209	7/22/09		38818	B59A3	Round 4 GW 2009											51	
GWM-01-1-R4	7/22/09	SVP/GWM-1	38818	B58X6	Round 4 GW 2009											51	
GWM-01-10-R4	7/22/09	SVP/GWM-1	38818	B58X5	Round 4 GW 2009											51	
GWM-01-2-R4	7/22/09	SVP/GWM-1	38818	B58X7	Round 4 GW 2009											51	
GWM-01-3-R4	7/22/09	SVP/GWM-1	38818	B58X8	Round 4 GW 2009											51	
GWM-01-4-R4	7/22/09	SVP/GWM-1	38818	B58X9	Round 4 GW 2009											51	
GWM-01-5-R4	7/22/09	SVP/GWM-1	38818	B58Y0	Round 4 GW 2009											51	
GWM-01-6-R4	7/22/09	SVP/GWM-1	38818	B58Y1	Round 4 GW 2009											51	
GWM-01-7-R4	7/22/09	SVP/GWM-1	38818	B58Y2	Round 4 GW 2009											51	
GWM-01-8-R4	7/22/09	SVP/GWM-1	38818	B58Y3	Round 4 GW 2009											51	
GWM-01-9-R4	7/22/09	SVP/GWM-1	38818	B58Y4	Round 4 GW 2009											51	
GWM-02-1-R4	7/22/09	SVP/GWM-2	38818	B58Y6	Round 4 GW 2009											51	
GWM-02-10-R4	7/22/09	SVP/GWM-2	38818	B58Y5	Round 4 GW 2009											51	
GWM-02-2-R4	7/22/09	SVP/GWM-2	38818	B58Y7	Round 4 GW 2009											51	
GWM-02-3-R4	7/22/09	SVP/GWM-2	38818	B58Y8	Round 4 GW 2009											51	
GWM-02-4-R4	7/22/09	SVP/GWM-2	38818	B58Y9	Round 4 GW 2009											51	
GWM-02-5-R4	7/22/09	SVP/GWM-2	38818	B58Z0	Round 4 GW 2009											51	
GWM-02-6-R4	7/22/09	SVP/GWM-2	38818	B58Z1	Round 4 GW 2009											51	
GWM-02-7-R4	7/22/09	SVP/GWM-2	38818	B58Z2	Round 4 GW 2009											51	
GWM-02-8-R4	7/22/09	SVP/GWM-2	38818	B58Z3	Round 4 GW 2009											51	
GWM-02-9-R4	7/22/09	SVP/GWM-2	38818	B58Z4	Round 4 GW 2009											51	
TB072209	7/22/09		38818	B5992	Round 4 GW 2009											51	
								Total Data Points reported	54	144	27	27	10	10	10	10	7038
								No. of Environmental Samples	20	7	20	20	10	10	10	10	118
								No. of Environmental Data Points <sup>2</sup>	40	112	20	20	10	10	10	10	6018

**Notes:**

1. Numbers in the grid represent the number of compounds in each analytical group.
2. Does not include field and trip blanks.

**Abbreviations:**

Table 1

**Data Usability - Pre-Remedial Design Investigation  
Sample Summary - Round 4  
Old Roosevelt Field Contaminated Groundwater Site  
Garden City, New York**

Sample Name	Date	Sample Location	Case No.	CLP ID.	Comment	QC Information/ Field Duplicate Parent	Total Fe & Mn	Total Metals-MS	Dissolved Fe	Dissolved Mn	HARDNESS	TDS	TSS	NH3	TKN	Trace-VOCs
FB		= Field blanks			Fe	= Iron										
TB		= Trip blanks			Mn	= Manganese										
CLP		= Contract Laboratory Program			NH3	= Ammonia										
ID		= identification			TDS	= Total Dissolved Solids										
QC		= quality control			TKN	= Total Kjeldahl Nitrogen										
MS/MSD		= matrix spike/matrix spike duplicate			TSS	= Total Suspended Solids										
MS		= mass spectrophotometry			VOC	= volatile organic compounds										

Analyses were performed by the following methods:

Hardness	MCAWW130-1; SM2340B
NH3	MCAWW350-1
TDS	MCAWW160-1; SM2540C
TKN	MCAWW351-2
Total and Dissolved Metals	ILM05.4
Trace Volatile Organics	SOM01.2
TSS	MCAWW160-2; SM2540D

**Table 2**

**Table 2a - Round 4 Field Duplicates, VOCs**

**Table 2b - Round 4 Field Duplicates, Metals and Wet Chemistry**

**Table 2a**  
**Data Usability - Pre-Remedial Design Investigation**  
**Round 4 Field Duplicates - VOCs**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, NY**

Units:  $\mu\text{g/L}$

Sample Code Sample Name Sample Date	GWM-04-5-R4		GWM-04-5-R4-DUP GWM-104-5-R4 7/23/2009		RPD 50%	ABS ≤5CRQL	GWM-10-5-R4		RPD 50%	ABS ≤5CRQL	GWM-11-3-R4-DUP GWM-110-5-R4 8/3/2009		RPD 50%	ABS ≤5CRQL	GWM-11-3-R4-DUP GWM-111-3-R4 7/30/2009		RPD 50%	ABS ≤5CRQL	GWM-12-1-R4-DUP GWM-112-1-R4 7/29/2009		RPD 50%	ABS ≤5CRQL	GWM-12-6-R4-GWM-12-6-R4-D GWM-112-6-R4 7/29/2009		RPD 50%	ABS ≤5CRQL								
	7/23/2009	7/23/2009	7/23/2009	7/23/2009			7/23/2009	7/23/2009			7/23/2009	7/23/2009			7/23/2009	7/23/2009	7/23/2009		7/23/2009	7/23/2009	7/23/2009	7/23/2009	7/23/2009	7/23/2009										
<b>Volatile Organic Compounds</b>																																		
Tetrachloroethene	83		91	9.2	NA		1.9	2			17.1	0.3	12	J	8.4	J	35.3	NA	0.52		0.66	23.7	0.14	4.4	3.8	14.6	U	NC	NA					
Trichloroethene	30		34	12.5	NA		220	#			0.0	NA	270	J	250		7.7	NA	4.9	6	20.2	NA	24	20	18.2	6.7	NA							
Dichlorodifluoromethane	15		11	30.8	NA		1.1	J	1	J	0.0	0	0.27	J	0.5	U	NA	0.23	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA				
Chloromethane	0.5	U	0.5	U	NC	NA	0.5	U	1	UU	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Vinyl Chloride	0.5	U	0.5	U	NC	NA	0.5	U	1	UU	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Bromomethane	0.5	U	0.5	U	NC	NA	0.5	U	1	UU	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Chloroethane	0.5	U	0.5	U	NC	NA	0.5	U	1	UU	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Trichlorofluoromethane	0.5	U	0.5	U	NC	NA	4.9	J	4	J	13.0	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
1,1-Dichloroethene	1.4		0.93	40.3	0.47		0.5	U	1	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5	U	0.5	U	NC	NA	0.5	U	1	UU	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Acetone	5	U	5	U	NC	NA	5	U	5	U	NC	NA	5	U	5	U	NC	NA	5	U	5	U	NC	NA	5	U	5	U	NC	U	NC	NA		
Carbon Disulfide	0.5	U	0.5	U	NC	NA	0.5	U	1	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Methyl Acetate	0.5	UJ	0.5	UJ	NC	NA	0.5	UJ	1	UJ	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Methylene Chloride	0.5	UJ	0.5	UJ	NC	NA	0.5	UJ	1	UJ	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
trans-1,2-Dichloroethene	0.5	U	0.5	U	NC	NA	0.5	U	1	U	NC	NA	0.27	J	0.26	J	3.8	0.01	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Methyl tert-Butyl Ether	3.4	J	3.4	J	0.0	NA	8.8	J	9	J	4.4	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	10.2	0.09		
1,1-Dichloroethane	0.31	J	0.5	UJ	46.9	0.19	0.21	J	1	UU	NA	0.29	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
cis-1,2-Dichloroethene	2.6		2.1	21.3	0.5		5	J	4	J	15.1	NA	46	J	43		6.7	NA	0.49	J	0.47	J	4.2	0.02	14	J	1	J	33.3	6.1	NA			
2-Butanone	5	U	5	U	NC	NA	5	U	5	U	NC	NA	5	U	5	U	NC	NA	5	U	5	U	NC	NA	5	U	5	U	NC	U	NC	NA		
Chlorobromomethane	0.5	U	0.5	UJ	NC	NA	0.5	UJ	1	UJ	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Chloroform	0.5	U	0.5	UJ	NC	NA	0.5	UJ	0	J	NC	NA	0.29	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA	
1,1,1-Trichloroethane	0.45	J	0.3	J	40.0	0.15	0.5	UJ	1	UU	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Cyclohexane	0.5	U	0.5	U	NC	NA	0.5	U	1	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	NC	NA		
Carbon Tetrachloride	0.5	UJ	0.5	UJ	NC	NA	0.26	J	1	UU	NA	0.24	0.82	0.42	J	38.5	0.2	0.5	U	NC	NA	0.5	U	0.5	U	NC	NA	0.5	U	0.5	U	NC	U	

Table 2b

**Data Usability - Pre-Remedial Design Investigation  
Round 4 Field Duplicates - Metals and Wet Chemistry  
Old Roosevelt field Contaminated Groundwater Site  
Garden City, New York**

Metals: Units  $\mu\text{g/L}$ 

Sample Code Sample Name Sample Date Criteria	CRQL Value	GWM-12-6-R4 7/29/2009	GWM-12-6-R4-DUP GWM-112-6-R4 7/29/2009	RPD	ABS	Comment
Inorganic Analytes				50%	$\leq 5\text{CRQL}$	
Antimony	2	2 U	2 U	NC	NA	
Arsenic	1	0.26 J	0.19 J	31.1	0.07	ok
Barium	10	12.7	12.4	2.4	0.3	ok
Beryllium	1	1 U	1 U	NC	NA	
Cadmium	1	1 U	1 U	NC	NA	
Chromium	2	0.82 J	0.7 J	15.8	0.12	ok
Cobalt	1	1	0.98 J	2.0	0.02	ok
Copper	2	0.87 J	0.87 J	0.0	0	ok
Lead	1	0.041 J	0.081 J	65.6	0.04	ok
Manganese	1 - 5	17.6 J	17.7 J	0.6	0.1	ok
Nickel	1	6.4	3.9 R	48.5	2.5	no further evaluation required
Selenium	5	1.7 J	1.6 J	6.1	0.1	
Silver	1	1 UJ	1 UJ	NC	NA	
Thallium	1	0.074 J	0.066 J	11.4	0.008	ok
Vanadium	5	0.33 J	0.29 J	12.9	0.04	ok
Zinc	2	15.8 J	14.5 J	8.6	NA	ok

Sample Code Sample Name Sample Date Criteria	CRQL Value	GWM-11-3-R4 7/30/2009	GWM-11-3-R4-DUP GWM-111-3-R4 7/30/2009	RPD	ABS	Comment
Wet Chemistry: mg/L				50%	$\leq 5\text{CRQL}$	
Iron dissolved	100	3000	3000	0.0	NA	
Iron Total	100	3500	3600	2.8	NA	
Manganese Dissolved	1 - 5	190	190	0.0	NA	
Manganese Total	1 - 5	180	180	0.0	NA	
<b>Wet Chemistry: mg/L</b>						
Nitrogen, Total Kjeldahl	0.1	0.19	0.16	17.1	0.03	
Total Dissolved Solids		560	590	5.2	NA	
Total Suspended Solids	4	29	20	36.7	NA	
Nitrogen, Ammonia	0.05	0.12	0.11	8.7	0.01	
Hardness As $\text{CaCO}_3$		32	32	0.0	NA	

**Abbreviations:** $\mu\text{g/L}$  = microgram per liter

ABS = absolute difference

 $\text{CaCO}_3$  = calcium carbonate

CRQL = contract required detection limit

DUP = duplicate

J = estimated

MS = mass spectrometry

NA = not applicable

NC = not calculable

RPD = relative percent difference

U = non-detect

**Table 3 - Field Blank Results**

**Field Blank Detections**

**Trip Blank Detections**

Table 3

**Data Usability - Pre-Remedial Design Investigation**  
**Field and Trip Blank Detections - Round 4**  
**Old Roosevelt Field Contaminated Groundwater Site**  
**Garden City, New York**

Trace VOCs and metals: µg/L

Chemical Name	Sample Code Sample Date	FB072209 7/22/2009	FB072309 7/23/2009	FB072409 7/24/2009	FB072709 7/27/2009	FB072809 7/28/2009	FB072909 7/29/2009	FB073009 7/30/2009	FB073109 7/31/2009	FB080309 8/3/2009	FB080409 8/4/2009
<b>Volatile Organic Compounds</b>	CRQL										
Methylene Chloride		0.5	0.5 U	0.5 U	0.36 J						
Chloroform		0.5	0.78	0.63	0.5 U	0.5 U	0.5 U				
Toluene		0.5	0.5 U	0.23 J	0.5 U						
<b>Inorganic Analytes</b>					No	Hits					

Trace VOCs - Units: µg/L

Chemical Name	Sample Code Sample Date	TB072209 7/22/2009	TB072309 7/23/2009	TB072409 7/24/2009	TB072709 7/27/2009	TB072809 7/28/2009	TB072909 7/29/2009	TB073009 7/30/2009	TB073109 7/31/2009	TB080309 8/3/2009	TB080409 8/4/2009
<b>Volatile Organic Compounds</b>	CRQL										
Methylene Chloride		0.5	0.5 U	0.15 J	0.38 J						
Chloroform		0.5	0.89	0.5 U	0.5 U	0.5 U					

**Notes and Abbreviations:**

1. Compounds for which there were no detects are not included in the table above.
2. Hits above the CRQL are highlighted and bolded.
3. Hits below the CRQL are highlighted and italicized.

FB = Field blank

TB = Trip blank

TCL - target compound list

µg/L = microgram per liter

U = Non-detect

J = Estimated

VOC = volatile organic compound

**Table 4**  
**Quantitation Limits Above Project-Specific Groundwater**  
**Criteria**

Table 4

Data Usability - Pre-Remedial Design Investigation  
Round 4 Groundwater Data Sensitivities for Trace Volatile Organic Compounds  
Old Roosevelt Contaminated Groundwater Site,  
Garden City, New York

Trace Volatile Organic Compounds	QAPP Project Action Limit ( $\mu\text{g}/\text{L}$ )	QAPP Project Quantitation Limit Goal ( $\mu\text{g}/\text{L}$ )	Site Specific Groundwater Criteria	Sample Reported CRQLs (e.g., GWM-01-10-R4)
cis-1,3-Dichloropropene	NL	NL	0.4	0.5 U
trans-1,3-Dichloropropene	0.5	0.5	0.4	0.5 U
1,2-Dibromoethane	NL	NA	0.0006	0.5 U
1,2-Dibromo-3-chloropropane	0.5	0.5	0.04	0.5 U

**Notes and Abbreviations:**

Compounds listed above have reporting limits above or at the site-specific groundwater criteria; however, they meet the QAPP Action Limits and Goals as presented in the March 2008 QAPP.

CRQLs - contract required quantitation limits

N/A - not applicable

NA - not applicable

NL - not listed

QAPP - quality assurance project plan

$\mu\text{g}/\text{L}$  - microgram per liter

**Table 5**  
**Completeness of the Data Set**

**Table 5**  
**Data Usability - Pre-Remedial Investigation**  
**Completeness of the Data Set**  
**Old Roosevelt Field Contaminated Groundwater Site - Round 4**  
**Garden City, New York**

Method	Analytical Parameter	Non-Detects	Hits	Rejects	Total	Estimated Hits	Percent Estimated (Hits Only)	Percent Rejected
ILM05.4	CLP TAL Metals	0	40	0	40	0	0.0	0
ILM05.5-MS	CLP TAL Metals	23	88	1	112	66	58.9	0.9
ILM05.4	Iron Dissolved	11	9	0	20	0	0	0
ILM05.4	Manganese Dissolved	0	20	0	20	0	0	0
130.1	Hardness	0	10	0	10	0	0	0
160.1	Total Dissolved Solids (TDS)	0	10	0	10	0	0	0
160.2	Total Suspended Solids (TSS)	6	4	0	10	0	0	0
350.2	Ammonia (NH3)	7	3	0	10	0	0	0
351.3	Total Kjeldahl Nitrogen (TKN)	5	5	0	10	0	0	0
SOM01.2	TCL Trace VOC	5400	611	7	6018	238	4.0	0.1
	<b>Totals</b>	<b>5452</b>	<b>800</b>	<b>8</b>	<b>6260</b>	<b>304</b>	<b>4.86</b>	<b>0.13</b>

Percent of all Data Rejected	0.13
Percent of all VOCs Rejected	0.00
Percent of all Hits Estimated	4.86
Percent complete (judged valid)	99.87

(does not include estimated non-detect data)  
 (Includes all estimated data)

**Abbreviations:**

TAL = total analyte list

CLP = contract laboratory program

TCL = total compound list

DESA = Division of Environmental Science and Assessment

VOC = volatile organic compound